

# MARINE REVIEW

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## MORE VESSELS FOR THE COAST.

THE MANHATTAN STEAMSHIP CO. OF NEW YORK SECURES FIVE LAKE STEAMERS FOR COASTWISE SERVICE—TO GO TO PHILADELPHIA.

Another company has entered the field to secure lake vessels for the Atlantic coast trade. The newcomer is the Manhattan Steamship Co. of New York, with principal offices in the Bowling Green building at 5-11 Broadway. In a letter to the Review, Mr. N. L. Newcomb, general manager of the company, says: "We have about concluded negotiations for five steam barges which we propose taking to Philadelphia, where alterations and changes will be made fitting them for coastwise work." The inference is left that the vessels have been purchased outright. The Manhattan company has not made public the names of the vessels for which negotiations are being carried on, but it is understood that two of the number are the steamers Linden and H. E. Runnels, owned by the Jenks Ship Building Co. of Port Huron, Mich. The H. E. Runnels, which was built in 1893, is 182 feet keel by 35 feet beam. She has a capacity of about 1,300 or 1,400 tons of coal and an insurance valuation of 45,000. The Linden was built in 1895 and is 206 feet keel by 35 feet beam. She has a carrying capacity of about 1,400 to 1,500 tons and an insurance valuation of \$62,500. Both are wooden vessels.

The vessels under charter by the Atlantic Transportation Co. of New York are, with few exceptions, on their way down the St. Lawrence, or preparing to start. The company has made one additional charter in the steamer Gettysburg, owned by Alger, Smith & Co. of Detroit. She is 208 feet keel by 37 feet beam, with a carrying capacity of about 1,300 tons and an insurance valuation of \$65,000. This addition makes the aggregate carrying capacity of vessels chartered by the Atlantic company a little more than 70,000 tons.

There is still some question as to whether the steamer Lindsay and the barge Brunette will be gotten over the rapids of the St. Lawrence on account of their draught of water. The Brunette draws 7 feet 4 inches forward and 7 feet 6 inches aft. The charter of the Gettysburg, however, is not designed to provide a substitute for the Lindsay. Instructions given to the pilots in taking vessels down the St. Lawrence are simply to keep a straight course down stream, and if they strike any obstruction to do all in their power to prevent the vessels from swinging. If a vessel swings it means disaster. Many vessel men have wondered that M. A. Bradley did not charter to the Atlantic company any of his wooden barges, of which he has quite a number. He was given an opportunity to figure for charter but did not take advantage of it. He is said to be opposed to chartering on general principles.

## Reduced Ore Output—Prosperous Season.

Exact figures regarding iron ore shipments from the entire Lake Superior region to Oct. 1 are at hand, and it is now quite certain that the 1898 output will not be much in excess of 13,000,000 gross tons, although it was expected when the season opened that the total would be 14,500,000 tons. This estimate was dropped more than two months ago, when it was found that labor was getting scarce everywhere in the mining region, but it was not thought that the output would be cut down still further on account of high freights, as has been the case during the past six weeks. September shipments were 243,981 tons short of the shipments in September, 1897, but the shipments of the season thus far are still 1,186,630 tons in excess of last year, as the output on Oct. 1 aggregated 10,994,201 tons, against 9,807,571 tons on Oct. 1, 1897. More ore might be sold and the output would undoubtedly be increased without sales but for the steady advance in lake freights, due to an immense movement of grain. Grain freights are now up to a basis of 2¼ cents on corn from Chicago, and there is little damage of a backward movement during the balance of the season, on account of the delays that are being encountered by vessels everywhere. Some of the ore shippers undoubtedly look for a "slump" in grain that will admit of their bringing down a little more ore than they are now certain of, but in any event the backward movement in rates will not be of importance, as ore would be found to make up any loss in grain. It is reported that 3 cents has been paid on some grain to be moved from the head of the lakes to Buffalo during November. Coal shippers are fortunate in having moved practically all of their output for Lake Superior at 20 and 25 cents, but there is still considerable coal to go to Lake Michigan, on which high freights may be paid. The season will close for vessel men in a manner far in excess of their highest expectations as to rates of freight.

An article originating in the Detroit Free Press, and which has gone the rounds of the lake papers, announces that sentiment among members of the Lake Carriers' Association toward the proposed railroad bridge across the Detroit river has changed, and that the railroad companies will find little difficulty in securing the passage of a bridge bill in the next congress. There is absolutely no grounds for this statement. The position of officials of the Lake Carriers' Association is the same as it has always been—against a bridge that will in any way interfere with navigation in the river. The railroad companies are worse off now than they have ever been on this subject. The action of the Grand Trunk, Wabash and Flint & Pere Marquette interests, in introducing a measure in the last congress that was entirely contrary in many respects to the contentions of the Michigan Central, as represented by Attorney Henry Russell of Detroit, places the bridge advocates in a worse light before congress than they have ever been in the past.

## SHIPS THAT WILL PASS IN THE WELLAND.

RELIABLE INFORMATION AS TO EXTREME DIMENSIONS OF VESSELS SUITED TO TRADE IN CANADA'S NEW WATERWAYS—MODEL HAS MUCH TO DO WITH SHIPS GETTING THROUGH.

The departure of the fleet of vessels chartered by the Atlantic Transportation Co. for coast service, and the frequent discussion of the opportunities for trade that will be opened by the enlargement of the locks of the St. Lawrence canals to Welland size, has induced much inquiry on the part of men identified with shipping interests as to the extreme dimensions of vessels that may be passed through the Welland. This inquiry has, of course, been increased in view of the agitation for abolition of Welland canal tolls, and in view also of the fact that the locks of all canals under construction in the St. Lawrence will be when completed (next year, according to claims of Canadian government officials) of similar size to those in the Welland.\*

The Welland locks are, as has frequently been stated, 270 feet long from mitres of the gates, and 45 feet wide, but this does not convey an adequate idea of the largest size of vessel that may lock through, as that is dependent on the model of the bow and stern of the vessel. A vessel that is sharp forward at the deck line and narrow at the stern can lock several feet longer than one that is full forward or has a broad stern. Moreover, a vessel with a narrow beam can lock longer than one that is nearly full beam of the locks. The lock gates mitre at an angle of 90 degrees, and any designer or builder of vessels can, of course, upon inspection of a drawing of the ship, tell at once whether she will or will not lock through.

According to information furnished by Carter Bros., tug and vessel owners of Port Colborne, Ont., the steamer Aragon, now on her way down the St. Lawrence, is about the largest vessel that can pass through the Welland. The Aragon is 247 feet 7 inches keel and 42 feet 6 inches beam, the various registers not giving her length over all. The steamer Colonial is about as large a vessel of that kind of model as can pass the locks. Her dimensions are 244 feet 5 inches keel and 36 feet 3 inches beam, the length over all, as nearly as could be measured at the canal, being 258 feet 9 inches. The overhang aft on the Colonial is probably longer than that of the Aragon, which enables the Aragon to lock with a longer keel and more beam. In addition, the Aragon being a steel boat, has a narrow stem and stern and is not bluff forward.

Another vessel that just about reaches the limit of the Welland locks is the William A. Haskell, owned by the Ogdensburg Transportation Co. Her keel measurement is 242 feet 5 inches and her beam 37 feet. The Ogdensburg company built the Haskell first, with the idea of taking full advantage of the Welland locks, but when their other vessels, the Governor Smith, A. McVittie, J. R. Langdon and Henry R. James were built, they were made only 240 feet keel and 42 feet beam. It will thus be seen that whereas the beam was increased 5 feet, the keel length was shortened 2 feet 7 inches. The overhang aft of the last mentioned vessels is practically the same as that of the William A. Haskell.

When a vessel is a close fit in length more or less delay is encountered in the operation of locking. It will thus be readily understood that the reason why a steamer of narrow beam can lock longer than one of greater beam, or nearly full width of the locks, is found in the fact that the vessel of less beam may be swung to one side of the lock and one gate opened, and then to the other side while the other gate is being opened. In a similar manner, coming up through the canal, the stern may be swung one way and then the other in order to permit of the gates being closed. As an illustration it may be stated that whereas a boat might lock 260 feet over all if only 33 feet beam, a vessel with the same type of hull could not lock over 255 feet if of 43 feet beam.

A wooden vessel that is of very nearly maximum lock dimensions is the Black Rock. She is of exactly the dimensions referred to above—255 feet over all and 43 feet beam. Her captain states, however, that if his vessel was not so full forward and was narrower on the quarters aft she could lock a little longer, as in locking through now the gates strike the bluff of her bows in opening and strike her quarters aft in closing. The Black Rock carries 68,000 bushels of wheat on a draught of 14 feet of water.

In this connection interest attaches to the dimensions of the steel steamers belonging to Mr. R. R. Rhodes of Cleveland. The Minneapolis and St. Paul, which are sister ships and 238 feet keel by 42 feet beam, were built with especial reference to the dimensions of the Welland locks, it being the intention of their owner to place them in the Montreal grain trade as soon as the St. Lawrence canals are completed. Last week Mr. Rhodes sent his steamer the Robert R. Rhodes to the Welland canal for purposes of measurement, and it was found that, although the vessel is 246 feet keel by 40 feet beam, she can be locked through. A comparison of dimensions will show that the greater length is offset by the narrower beam in accordance with the theory above outlined.

It will be understood, of course, that vessels passing through the Welland cannot all go on down to the seaboard. Only those of very light draft, not more than 7½ feet, can run the rapids of the St. Lawrence.

\*It is understood, of course, that when the work of enlarging the locks of St. Lawrence canals to dimensions of the Welland is completed there will be none of the difficulties now encountered in having vessels destined for the seaboard run the rapids of the St. Lawrence river.

Archie E. Moffat of the navigating department of the United States cruiser Baltimore has favored the Review with a large diagram showing the positions and movements of the United States vessels at the battle of Manila bay.



## DOMINION LINER NEW ENGLAND.

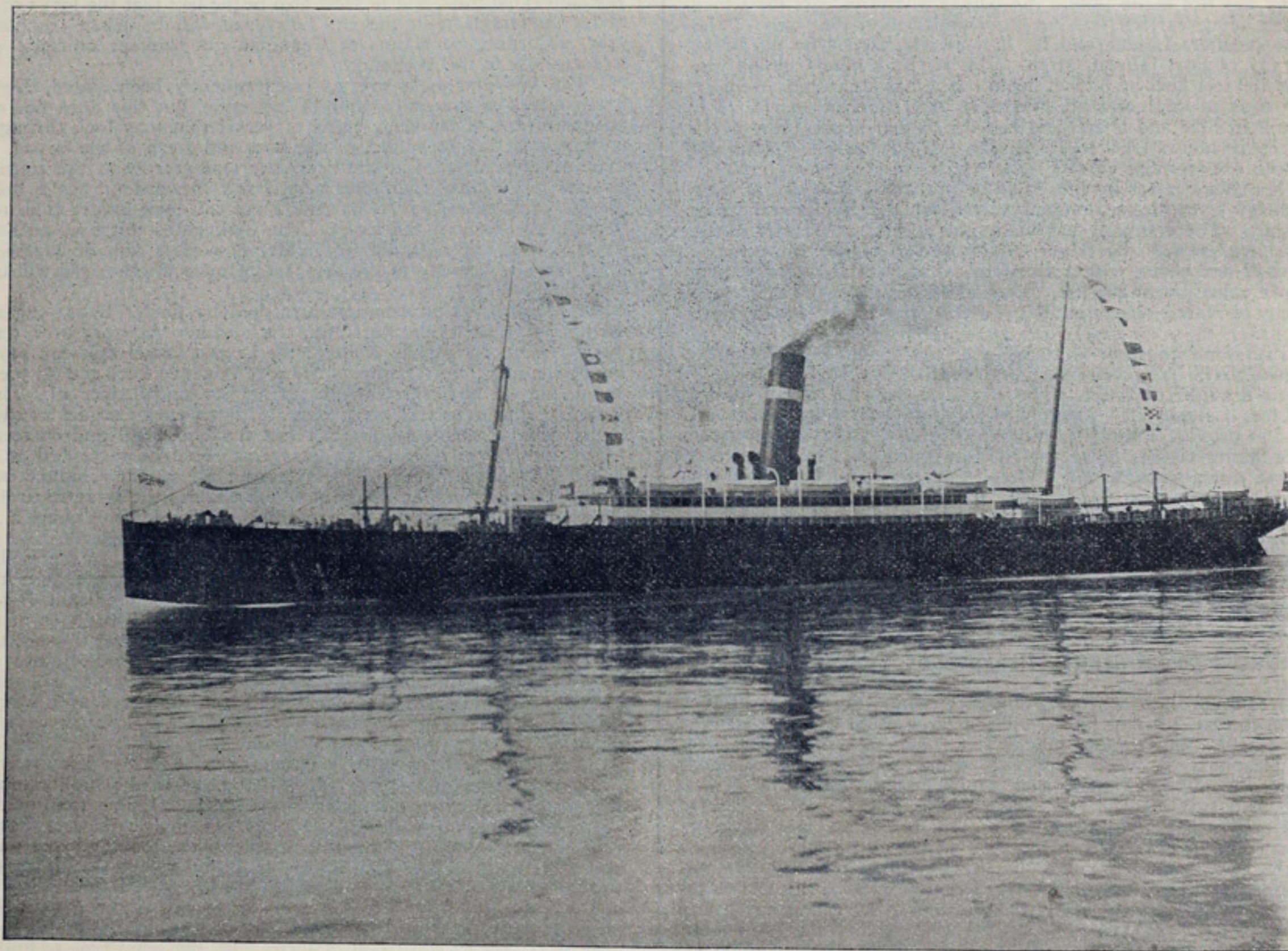
LATEST ADDITION TO THE COMPANY'S TRANSATLANTIC FLEET—A MAGNIFICENTLY APPOINTED VESSEL IN EVERY RESPECT.

Perfection of equipment and general efficiency characterize the twin-screw steamer New England, which constitutes the latest addition to the fleet of the Dominion Steamship Co., and a picture of which is herewith presented. The new steamer was placed on the route between Boston and Queenstown and Liverpool only a little over two months ago, and is now claimed, in some of the reports sent out regarding her, to be the second or third largest British steamer afloat. She is at least, the largest transatlantic liner that ever visited the port of Boston.

The New England is built on the same general lines as the steamer Canada, also of the Dominion line, and is a product of the Harland & Wolff works at Belfast, Ireland, where she was launched early in April. The vessel is 565 feet over all, 59 feet beam, 30 feet draught, and has a registered tonnage of 7,417 net or 11,345 gross tons. The machinery consists of two sets of quadruple expansion engines, each having cylinders 30, 50, 58 and 58 inches in diameter by 54-inch stroke, which enable the vessel to attain a speed of 17 knots under favorable conditions. Even with new

## The New Cassatt Yacht.

So much interest has been aroused in the new yacht for which J. G. Cassatt, the Philadelphia banker, recently closed a contract with the Roach ship yard at Chester, Pa., that the Review is impelled to give a more extended description of the vessel than was printed in these columns some weeks ago. The yacht will be of steel, 166 feet over all, 21 feet beam and 11 feet 6 inches draught. Power for propulsion will be furnished by a triple expansion engine, with cylinders 12, 19½ and 31 inches diameter by 21 inches stroke. Two Almy water tube boilers will supply steam at high pressure. Engines will be of about 800 indicated horse power. The vessel will be fitted with an electric light plant with a capacity of 100 lamps, and ample storage batteries will be supplied to be charged during the day, so that no vibration of the dynamo engine will be felt at night. The arrangement of the under deck plan will be novel in several respects. The interior finish will be largely of bird's eye maple. Owner's quarters, consisting of three staterooms, bathroom and saloon, will be forward, while the ladies' apartments, consisting of two staterooms and bathroom, are aft. The dining saloon, on deck, will be of teak; aft of it the pantry, and aft of that the galley. Forward there will be three staterooms for captain, engineer and steward, together with a mess room. Quarters for a crew of fourteen will be provided in the forecabin. Below the lower



NEW PASSENGER AND FREIGHT STEAMER NEW ENGLAND, OF THE DOMINION LINE.

machinery, the initial trip of the vessel from Daunts rock, Queenstown harbor, to Boston light was made in 6 days, 11 hours and 38 minutes, a daily average of about 400 miles.

The general arrangement of the vessel is declared by men conversant with the needs of transatlantic traffic to be well nigh model. The poop deck aft is reserved for a promenade deck, and there is a smoking room for the exclusive use of the steerage. The dining room is large and airy, and the saloon is situated in the deck house and has a seating capacity of almost 200. A majority of the staterooms are in this same house. On the deck below is the second class saloon (capable of seating 150), a number of first and second class staterooms, the officers quarters, galleys, etc. The middle deck has staterooms for the first class passengers forward and for the second class passengers aft. The saloon deck has a spacious promenade, and the captain's room and chart room are on the boat deck with the pilot house above. The vessel is designed to carry 280 saloon passengers, 270 second cabin and nearly 1,000 steerage passengers. The New England is supplied with refrigerating machinery and a complete electric plant, and has also all the necessary appliances for the rapid loading and discharging of a large general cargo. The vessel, which has two pole masts, will, however, be capable of crossing the Atlantic at any season of the year, without cargo, if desired, having large water ballast tank fitted fore and aft. Capt. James MacAuley, formerly of the Canada and commodore of the Dominion fleet, is in command of the new ship. The cost of this vessel was about \$1,250,000. She carries a crew numbering 190. It is announced, also, that the Dominion line now has in course of construction at Belfast another steamer for its Boston service of even greater dimensions than the New England. This second new vessel will be christened the America, and is expected to be ready to cross the Atlantic on her maiden voyage in June. The line will then maintain a regular weekly service to Boston.

deck forward will be cold storage rooms. The yacht is to be used for long cruises, particularly in the Mediterranean, and the owner has specified that she shall be constructed after the model of English cruising yachts. The speed stipulated is 14 knots, and the boat is to be ready to go into commission in the spring.

## Ship Building Company Formed at Richmond.

The organization of the new ship building company projected at Richmond, Va., by William R. Trigg, president of the Richmond Locomotive & Machine Works, has been completed. A meeting was held a few evenings since and the \$300,000 authorized capital stock was all subscribed in a few minutes. Mr. W. R. Trigg was elected president, Lilburn T. Myers, vice-president, and W. C. Preston, secretary and general counsel. Authorization was given for the signing of contracts for three torpedo boats and three destroyers for the government, and contracts for the material of hulls and for the engine work were awarded. All preparations are along the line of the provision of a permanent ship building plant capable of constructing battleships of the largest size. Over 400 men will be given employment at the outset. The James River Committee, an organization of public-spirited citizens of Richmond, has already taken steps looking to the expenditure of a large sum in the improvement of the river, largely in order to facilitate the ship yard project. It is proposed that the city and the Chesapeake & Ohio Railroad Co. shall co-operate in the construction of a large dyke. Later, it is believed, the United States government can be induced to co-operate in the work of improvement.

Simon Lake of Baltimore, inventor of the submarine boat Argonaut, has taken out a patent on an apparatus for floating stranded vessels.



## CITY OF MEMPHIS—A RIVER CRAFT.

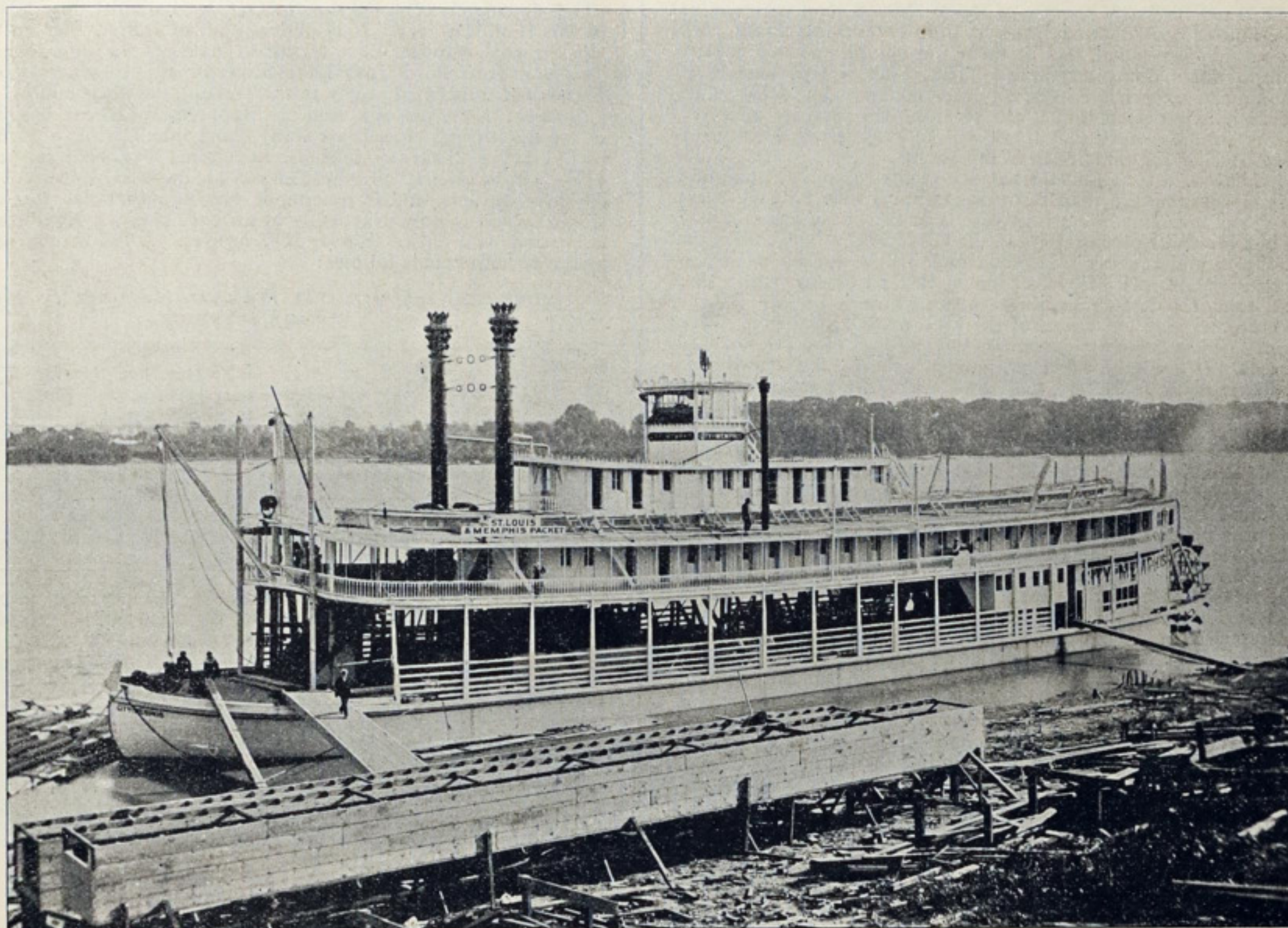
FREIGHT AND PASSENGER STEAMER BUILT BY ED. HOWARD OF JEFFERSONVILLE, IND., FOR THE ST. LOUIS AND TENNESSEE RIVER PACKET CO.

There is no better-known builder of river steamers in America than Capt. Edward Howard of Jeffersonville, Ind., and although some magnificent vessels have been turned out at the Howard yard in past years, it is generally admitted that they cannot compare, either in speed or trimness of appearance, with the more recent products of this works. Indeed several of the steamers launched at the Howard yard within the past few months have been exceptional in so many ways as to attract attention from steamboat men everywhere from Pittsburg to New Orleans.

This is especially true in the case of the steamer City of Memphis, built to the order of the St. Louis & Tennessee River Packet Co., and delivered only a few days ago. The vessel was built under the special supervision of Capt. James Koger, general superintendent of the Packet company, and is claimed by both he and her builders to be as complete a freight and passenger steamer as has ever been constructed on the rivers. The City of Memphis is 200 feet over all, 36 feet beam and 6 feet depth of hold. Her engines have 16-inch cylinders by 7-foot stroke, with

discusses the subject under three heads—first, the number, size and armament of the war vessels to be maintained by each power on the lakes; second, the privileges to be extended to lake shipbuilders in the construction of war vessels; third, the maintenance of the naval militia on the lakes and the assignment to them of naval vessels for drill and cruising practice. Under the first head the board recommends that each power be authorized to maintain two war vessels of at least 1,100 tons each. The gunboat type of the general build and equipment of the Marietta is suggested as meeting the requirements of the United States on the lakes. No armament should be specified except that it should be "appropriate," for the reason that improvements in naval ordnance might render obsolete any definite arrangement on this score. The necessity for maintaining two vessels is insisted upon by the board for policing purposes and to facilitate naval recruiting on the lakes, where the hardiest and most skillful sailors are found. Further, there should be an understanding that no limit should be placed upon the number of lighthouse or revenue service vessels maintained. In addition, the United States should be permitted to construct and maintain a suitable naval station as winter quarters for the warships referred to.

As to the second head, the board recommends that the lake ship yards be permitted to construct any type of vessels that can be sent to tidewater.



RIVER STEAMER CITY OF MEMPHIS, BUILT BY ED. HOWARD, JEFFERSONVILLE, IND.

the California cut off and other late improvements. Steam is supplied from three steel boilers, each 44 inches in diameter by 24 feet in length, and each supplied with ten 6-inch flues made of 29-100 steel. A complete electric light plant has been installed. The hull is of graceful design, well built, and constructed with a view to strength and carrying capacity. The cabin, which is a full length one, is of elaborate design and the passenger accommodations are adequate.

## WAR SHIPS ON THE LAKES.

SECRETARY OF THE NAVY LONG HAS TAKEN UP THE QUESTION OF THEIR CONSTRUCTION IN LAKE SHIP YARDS—ANGLO-AMERICAN COMMISSION FULLY INFORMED ON THE SUBJECT.

According to dispatches sent out from Washington within the past few days there would seem to be ground for belief that something tangible may be expected in the way of modification of that part of the Rush-Bagot treaty between Great Britain and the United States which prevents ship builders in lake cities from bidding for the construction of war vessels. Secretary Long some time ago, it seems, appointed a board consisting of Naval Constructor Dashiell and Lieutenants Satterlee and Seymour to take up the whole subject of agreements on this score embodied in the treaty of 1817, above referred to, and recommend what if any modifications should be made. The question of the building of war vessels on the lakes was, of course, only one of many matters to be investigated, but it may generally be regarded as the most important.

This board has reported to the secretary through Judge Advocate-General Lernby, and the secretary in turn has forwarded the report to the commission with a strong indorsement of its conclusions. The report

At the present time this would limit the lake yards to gunboats, torpedo boats, etc., but in the event of the construction of a deep waterway to the sea—a matter of the far future, however—the largest battleships could be built on the lakes. The agreement should provide that the armament of vessels constructed on the lakes should not be placed aboard them until tidewater is reached. This would be a necessity in any event, as the vessels would require to be lightered to get them through the canals.

The board recommends in the third place that the naval militia be distinctly recognized in the new agreement, and, further, that it be stipulated that as many old warships, out of commission, as may be desirable shall be maintained to drill and exercise this auxiliary branch of the naval service.

## American Ship Material and Tools in Denmark.

American manufacturers of ship building material and ship yard tools seem to be gaining a foothold for their products in Denmark. Jules Blom, vice and deputy consul at Copenhagen, in a recent letter to the state department, says that several ship builders of Denmark, who formerly secured their supplies exclusively from Scotland, have, within the past few months, placed orders for plates, angles, etc., as well as the greater part of their forgings, with American firms, and he ventures the opinion that if these trial orders are filled in a satisfactory manner, the market will be gained permanently. He further writes that there is already a good market for drilling and boring machines, milling, planing and shaping machines, punching and shearing machinery, bolt cutters, and in fact American tools of all kinds. The principal dealers in machinery and tools in Copenhagen are: V. Lowener, 6 Kyasthusgade; William O. Jensen, 6 Jernbanegade; Nieustadt & Co., 20 Vestergade. These firms are rated by the commercial agency of P. Fournais & Co., Copenhagen.



## GRAIN SITUATION AT BUFFALO.

DETENTION MUST BE EXPECTED IN UNLOADING—A DECISION RELATING TO THE QUESTION OF DEMURRAGE.

Buffalo, N. Y., Oct. 12.—Grain has already begun to arrive at Buffalo at the rate of nearly 10,000,000 bushels a week. The situation as regards probable delays at elevators again presents some new features, the most prominent of which for the present is detention due to cargoes being divided up into a great many consignments. Cargoes have never been divided up as they are this season. Vessel men have entered little complaint on account of the degree of detention thus far encountered, some of them taking the situation quite philosophically with the remark that delays are a force of strength in lake freights, but there is probably a more stormy period ahead. As there is no elevator association here now and no charge for elevating grain and delivering to cars and canal boats, little grain is being handled except at the so-called railroad elevators, that is, the elevators controlled by railroads, namely, the City, Erie, Connecting Terminal, Union and Dakota, and the elevators controlled by a few large grain dealing and shipping concerns in Chicago, Philadelphia and New York, which are the Electric, Export, Coatsworth and Great Northern elevators. There is no direct return in the grain business for the elevators except \$1.20 per thousand for use of steam shovels, and with the exception of the houses named above, there is little or nothing doing. The canal houses, as they are called, that is, those not having railroad connection, are none of them doing anything. The result is that vessels are already beginning to experience in some cases considerable delay in unloading, and as it is expected that grain receipts will increase at a very heavy rate, it is almost certain that there will be very great detention in many instances during the remainder of the season.

A crowded harbor throughout the balance of the season will undoubtedly bring on discussion regarding demurrage, and it may be well, therefore, to refer vessel men to a demurrage case brought in the federal courts as the result of a blockade of ships here in the fall of 1891. The case is that of the J. E. Owen and consort Nihcolson and will be found in Vol. 54, Federal Reporter, page 185. The decision in this particular action does not, of course, cover the demurrage question as a whole at Buffalo. Neither would it have any bearing on claims of the kind made at Fairport, where grain was consigned in immense quantities with little regard for the facilities of elevators. It is a case, however, from which vessel men, who are liable to encounter delay at Buffalo, may draw conclusions as to what they may expect from the courts under prevailing conditions in the grain trade of the lakes. The Owen and Nicholson, laden with grain from Chicago, arrived at Buffalo on Friday, Nov. 27, at 6 p. m., consigned to elevators with New York Central Railroad connections. There were twenty-eight boats ahead of them. The amount of grain in Buffalo awaiting transshipment east was unprecedented and navigation was about to close. There was no demand that the consignees or their agents should furnish another elevator, and no claim for damages was made until after the grain was unloaded. The vessels were delayed ten days in unloading but the court refused to hold the consignees liable for damages resulting from the delay. The court held that damages are not recoverable where vessels are detained near the close of navigation, while waiting, in accordance with custom, to be unloaded in turn at an elevator, where there was nothing to show that the delay was unreasonable. In summing up the case, Judge Coxe, before whom the action was tried, said:

"Applying the law to the facts in hand it is clear that the libellant is not entitled to damages for the detention of these vessels. The onus was upon the libellant to prove negligence, but a doubt has simply been raised. The interpretation of the testimony most favorable to the libellant only establishes the proposition that if the consignees had been informed of the exact capacity of the other elevators during the time in question, they might possibly have secured the necessary room. This, in no circumstances, is sufficient to establish negligence. The grain was consigned to elevators having New York Central Railroad connection; this was part of the contract; was well known to the libellant's agent, and, I am inclined to think, exonerated the consignees from providing another elevator; but assuming that they were required to look elsewhere, the proof falls far short of showing that they were guilty of laches in this respect. They certainly were not required to take a floating elevator or receive the grain for storage on an island or in canal boats. They were at least entitled to have their grain go on to its destination, and it could not go otherwise than by rail. I am not satisfied that they could have provided, during the week beginning Nov. 30, another elevator which could have released the vessels sooner than the City elevator. It is possible that they might have done so, but this possibility is not enough. Certainly the court would be unwarranted in finding that the libellant had established by a preponderance of evidence, that other elevators having railroad connections could have unloaded the vessels sooner than the City elevator. All the witnesses agree that the situation was unprecedented. An immense amount of grain had reached the harbor of Buffalo. Navigation was about to close. Every effort was being made to accommodate this extraordinary congestion. The elevators having railroad connections were being worked night and day. Everywhere there was a blockade of greater or smaller proportions. The energies of those engaged in the work of transferring these cargoes were taxed to the utmost, their time was occupied with the daily routine of this busy period. To hold men so situated responsible for the greatest care and diligence, to charge them with every item of information and knowledge which was only elicited by a protracted judicial investigation, would be to establish a new rule of law for the guidance of consignees. Indeed, after an examination, which was intended to be thorough, I have failed to find a single authority allowing damages in circumstances like those developed in the case at bar. Vessel owners can stipulate for lay days, if they so desire, but if they prefer not to do so they must take the risk of delays occasioned by such phenomenal circumstances as those which occurred at Buffalo in November and December, 1891. It follows that the libellant is not entitled to damages, but is entitled to recover freight in each action and interest from Dec. 9, 1891, besides costs."

W. W. Ogilvie, the Manitoba flour miller has begun the erection of a grain elevator of 2,000,000 bushels capacity at Montreal, Canada.

## ANOTHER RECORD-BREAKING SEASON.

MOVEMENT OF FREIGHT, EAST AND WEST, THROUGH ST. MARY'S FALLS CANALS NOW MORE THAN TWO MILLION TONS IN EXCESS OF LAST SEASON.

The movement of freight, east and west, through the American and Canadian canals at the Sault did not quite hold its own last month, as compared with the corresponding month last year, but nevertheless the excess over last season's movement, which on Sept. 1 was approaching the 2,000,000 mark, has now passed that figure. It is noticeable, however, that both the vessel passages and aggregate registered tonnage show hardly any increase, this circumstance being due, of course, as has been explained heretofore in the Review, to the advent of larger carriers and the availability of deeper channels. The figures for three years past are as follows:

	VESSEL PASSAGES.	REGISTERED TONS.	FREIGHT TONS.
To Oct. 1, 1898.....	13,486	13,777,982	15,631,855
To Oct. 1, 1897.....	13,256	13,516,107	13,589,183
To Oct. 1, 1896.....	15,150	13,998,075	12,793,441

Several distinctive characteristics of this season's traffic are still apparent. One is the doubling up of the volume of soft coal shipments, which aggregate 2,550,452 tons to Oct. 1, as against only 1,145,822 tons up to this time last year. It is understood, of course, that on Oct. 1 a year ago the coal shippers were trying to make up for time lost in the strike. The iron ore record from Lake Superior still shows an excess of about 850,000 net tons (made early in the season), notwithstanding the restricted movement of the past six weeks. Shipments of wheat, despite the activity of the month just closed, are away short thus far this season, the total to Oct. 1 being 21,414,527 bushels, as against 30,874,381 bushels to Oct. 1, 1897. Grain other than wheat shows an increase, however, of more than 2,000,000 bushels, and in passing it may be noted also that the passenger traffic, which is now practically at an end, shows a significant betterment compared with either 1896 or 1897 figures. A full statement of the commerce of both canals follows:

## MOVEMENT OF PRINCIPAL ITEMS OF FREIGHT TO AND FROM LAKE SUPERIOR.

ITEMS.	To Oct. 1, 1898.	To Oct. 1, 1897.	To Oct. 1, 1896.
Coal, anthracite, net tons.....	352,668	362,171	297,582
Coal, bituminous, net tons.....	2,550,452	1,145,822	2,045,740
Iron ore, net tons.....	9,434,493	8,589,702	6,811,765
Wheat, bushels.....	21,414,527	30,874,381	42,553,060
Flour, barrels.....	4,541,807	5,766,039	5,578,862

## REPORT OF FREIGHT AND PASSENGER TRAFFIC TO AND FROM LAKE SUPERIOR, FROM OPENING OF NAVIGATION TO OCT. 1 OF EACH YEAR FOR THREE YEARS PAST.

EAST BOUND.				
ITEMS.	Designation.	To Oct. 1, 1898.	To Oct. 1, 1897.	To Oct. 1, 1896.
Copper .....	Net tons....	87,938	93,098	93,271
Grain, other than wheat .....	Bushels....	16,641,400	14,369,367	16,211,057
Building stone .....	Net tons....	4,670	4,641	16,439
Flour .....	Barrels.....	4,540,880	5,765,789	5,578,725
Iron Ore.....	Net tons....	9,434,493	8,589,702	6,811,765
Iron, pig.....	Net tons....	26,165	6,687	18,866
Lumber .....	M. ft. b. m.	660,488	580,043	537,571
Silver ore.....	Net tons....	.....	5	240
Wheat.....	Bushels....	21,414,527	30,874,381	42,553,060
Unclassified freight .....	Net tons....	174,122	180,659	141,789
Passengers.....	Number....	18,435	17,711	17,665

WEST BOUND.				
Coal, anthracite.....	Net tons....	352,668	362,171	297,582
Coal, bituminous.....	Net tons ..	2,550,452	1,145,822	2,045,740
Flour .....	Barrels .....	927	250	137
Grain .....	Bushels....	19,205	.....	2,209
Manufactured iron.....	Net tons....	166,242	84,167	67,256
Salt .....	Barrels .....	199,755	172,509	171,838
Unclassified freight.....	Net tons....	278,159	256,751	233,418
Passengers.....	Number ...	21,920	19,843	18,095

## SUMMARY OF TOTAL FREIGHT MOVEMENT IN TONS.

	To Oct. 1, 1898.	To Oct. 1, 1897.	To Oct. 1, 1896.
West bound freight of all kinds, net tons.....	3,376,146	1,883,801	2,676,101
East bound freight of all kinds, net tons.....	12,255,709	11,705,382	10,117,340
	15,631,855	13,589,183	12,793,441

Lieut. R. P. Hobson has suggested to the navy department the advisability of pulling the sunken Spanish cruiser Colon around so that she will lie parallel to the shore instead of stem on. His plan for floating the vessel contemplates the use of both air bags and dynamite. It is now claimed that the Reina Mercedes can be raised without any great trouble.



## CARGO RECORD BREAKER.

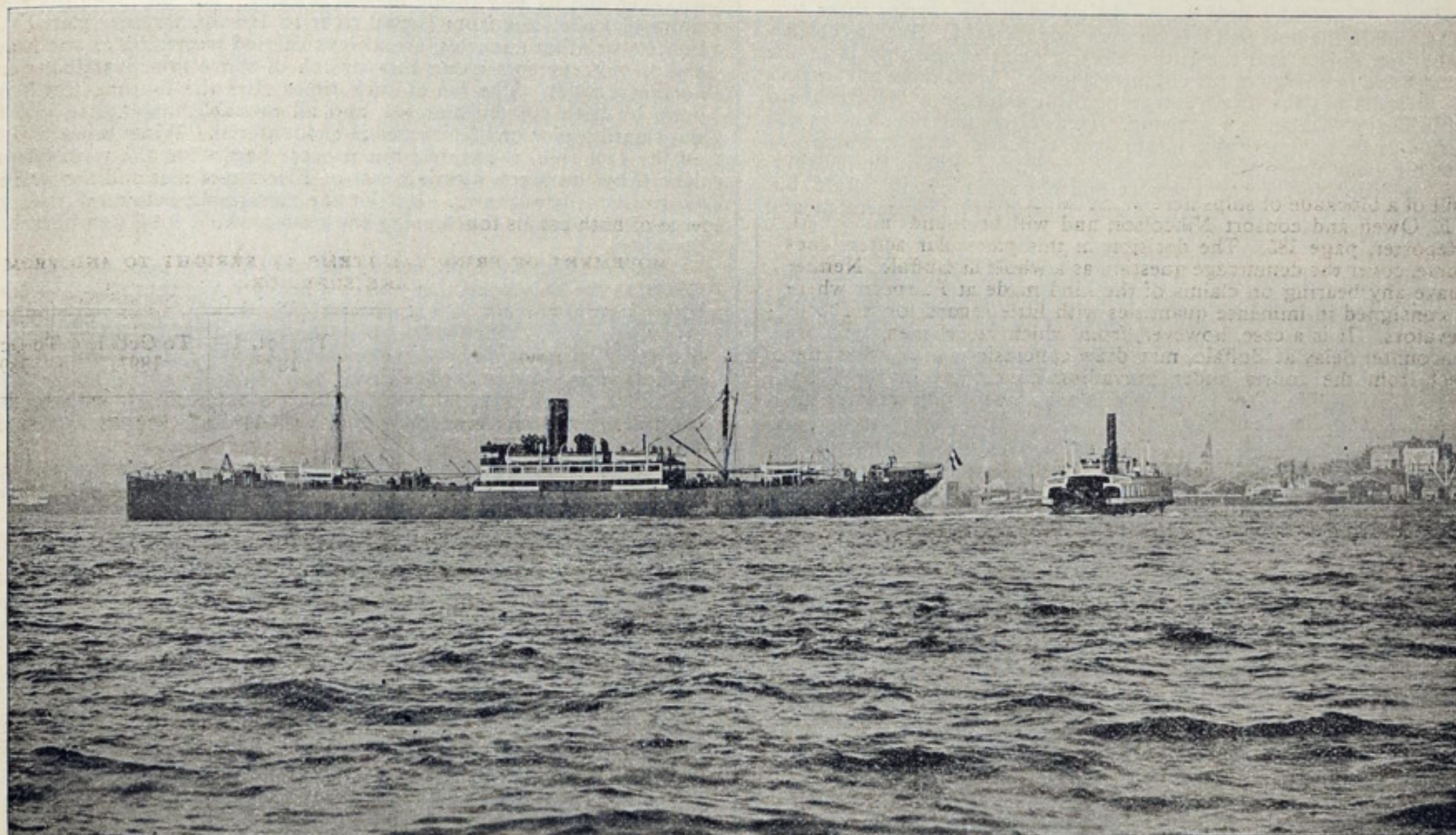
HAMBURG-AMERICAN LINER BRASILIA ENTITLED TO THAT DISTINCTION BY THE ACHIEVEMENTS OF HER FIRST SEASON.

Most persons identified with shipping interests feel more or less interest in the breaking of cargo records, and in this connection it may be noted that in all probability no vessel ever had a more remarkable series of accomplishments in this line to her credit than has the Hamburg-American liner *Brasilia*, which is yet in her first season. The first picture of the big freighter taken on this side of the Atlantic is herewith presented.

The Review in its issue of Sept. 29 referred to several new American records made by the *Brasilia*, but it has remained for the vessel to since establish a far more important record by delivering at London, England, a cargo of 14,700 tons, including 2,400 tons of slate—the largest cargo ever taken into the port of London. The vessel was completed only last year and has made but about half a dozen trips to American ports. On her third trip she broke all cargo records for the port of Philadelphia by bringing to that port a cargo aggregating 7,000 tons, of which a shipment of sugar constituted 6,000 tons. The Baltimore record was broken on Sept. 22, when the *Brasilia* sailed from that port carrying 11,000 tons (2,240 pounds), consisting of 232,000 bushels of grain and 5,000 tons of provisions, tobacco and lumber. Both these American records are, of course, repeatedly exceeded by vessels trading to New York, but it is

## The Wheeler Ship Yard.

West Bay City, Mich., Oct. 12.—The bondholders of F. W. Wheeler & Co., who hold a first mortgage on the ship yard at this place, do not seem to be progressing very rapidly with their plans for taking possession of the plant. The works are not disturbed, although it was expected that the bondholders would long ago have tried to take the plant and sell it off piecemeal. It is quite evident that an effort will be made, under Michigan law, to hold the stockholders of F. W. Wheeler & Co. liable as individuals for the labor claims, amounting to some \$23,000, which were bought up for the Bessemer company. Then there is another item of some \$24,000 which the Bessemer company claims was advanced to pay this labor, but which by some means of figuring between the banks and officials of the firm of Wheeler & Co. was diverted to other uses. But this is not all. It is said that the Bessemer company will present another claim of about \$70,000 for demurrage, additional expense in completing the vessels, etc., and that the various unpaid bills of Wheeler & Co., contracted between the time of issuing bonds and the assignment, also make up a very large item. These are all additional to the claims of the bondholders, and are therefore of little account as regards prospects of collecting them. The lien cases brought against the three Bessemer ships—Morse, Fritz and Roebing—after the failure of the ship building company number about thirty-five and aggregate about \$30,000. A hearing regarding these cases will probably take place next month. These are the claims of supply concerns who furnished material of various kinds for



NEW HAMBURG-AMERICAN LINER BRASILIA—A GREAT CARGO RECORD BREAKER.

doubtful if the London record established by the *Brasilia* has ever been equalled at the American metropolis.

The Review is indebted to Emil L. Boas, general manager of the Hamburg-American line, for a description of the vessel. She is 512 feet over all, 62 feet beam and 38 feet deep. Her displacement is 20,000 tons; gross register 10,961, and net register 8,370 tons. The ship has four decks and a double bottom, with 9,050 tons hold space for cargo ballast. The double bottom accommodates 1,600 tons of water ballast. The coal capacity of the steamer is from 1,500 to 2,000 tons, and between the four decks is 600,000 cubic feet of cargo space. Ten watertight transverse bulkheads divide the steamer into as many independent compartments, and seventeen boats with life-saving apparatus are distributed in proper order on the deck. Power for propulsion is furnished by two quadruple expansion engines, each of 2,000 indicated horse power, which drive the vessel at an average speed of about 12 miles per hour. The *Brasilia* is lighted by electricity, and a carbonic-acid freezing machine is installed in the storage room. She has two masts with schooner rig. Especial attention has been paid to the cargo handling equipment. For loading and discharging at the seven hatches there are eleven winches, ten cranes and eighteen cargo booms. Crew's quarters are commodious and well arranged, and there are also accommodations for eight cabin passengers, as well as for 600 steeragers in rooms containing from eight to fourteen berths. The steerage accommodation can be increased to 1,200 if necessary. Five steam ventilators on the awning deck are provided in connection with arrangements for the transportation of horses and cattle. The vessel is commanded by Capt. G. Reesing, and has a crew of eighty men.

The many friends of Mr. D. Sullivan of the well-known Chicago firm of J. G. Keith & Co., vessel and insurance agents, will sympathize with him in the loss by death on Wednesday of last week of his daughter aged 13 years. The funeral was held at Chicago on Friday, the 7th inst. Deceased had been an invalid for almost eight years, but it was not until the fore part of last week that her illness assumed a degree of seriousness sufficient to necessitate the constant presence of her father.

the vessels, and who are seeking to recover from the ships under the watercraft law of Michigan, but who meet with the contention from the Bessemer company that all material going into the ship yard while the vessels were under construction became the property of the Bessemer company as soon as it entered the yard. This condition is claimed to have been due to a contract entered into between the Bessemer company and the builders, whereby the latter were paid for all material and supplies immediately upon their delivery for use in the vessels.

## Movements of Naval Vessels.

The work of overhauling and repairing vessels of the United States navy is going forward with little or no delay. Nowhere have operations of this character been pushed with greater energy than at the navy yard at Mare Island, Cal. Work on the gunboat *Yorktown* will, it is expected, be completed by the latter part of the month. New boilers and engines for the *Ranger* have arrived at the yard and are ready to be placed in the vessel. The *Albatross* is being thoroughly overhauled and new machinery and boilers will be provided for the *Hartford*. The *Adams*, which has had a thorough overhauling, is almost ready to go into commission, and the *Mohican* has been withdrawn from commission. The 14-knot tug boat *Iroquois* has been assigned to duty as a dispatch boat between San Francisco and Honolulu. Her station will be at the latter port. The navy department has detailed the auxiliary cruiser *Stranger* to undertake the work of making a survey of the ports of Cuba and Porto Rico, with a view to the issuance of new charts.

In an address before the Manufacturers' Association of New York a few days ago Warner Miller said that the Nicaragua canal commission—Admiral Walker, General Haines and Professor Houpt—estimate the cost of the Nicaragua canal at not more than \$140,000,000, with only five years as the period necessary for its completion. It is evident that the canal company is now quite confident of securing from the next congress government backing for the canal.



# MARINE REVIEW

Devoted to the Merchant Marine, the Navy, Ship Building, and Kindred Interests.

Published every Thursday at No. 418-19 Perry-Payne building, Cleveland, Ohio, by John M. Mulrooney.

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Recent reports would seem to indicate that the English-built cruiser New Orleans, purchased from the Brazilian government at the outbreak of the war, has been maligned on the one hand and excessively praised on the other. In speaking of the claim of certain English journals that the vessel is superior to cruisers of American build, the Army and Navy Journal says: She is in many respects very different from our cruisers, being a sheathed teak and copper-bolted vessel, the only one of this class under Admiral Sampson. Her battery is formidable and superior, probably, gun for gun, to that of our ships mounting the same number. Her 6-inch gun mounts are better than ours, increasing the rapidity and effectiveness of her fire, but aside from this the guns possess no other advantage. She carries six 6-inch, quick-fire; four 4.7-inch quick-fire; ten 6-pounders; four 3-pounders; four Maxims; three 37-mm, 5-barrel machine guns, and two 12-pounder field guns. In addition she carries three torpedo tubes, one in the bow and one on each side forward. She has electrical ammunition hoists, and the entire electric plant of the ship is in the engine room and in charge of the engineer's force. With these advantages the New Orleans has the disadvantage of being built on a low-freeboard plan and in heavy weather is a wet ship. Her defects and deficiencies will be corrected as far as practicable in her sistership, the Albany, which was bought at the same time in an incomplete condition. She is unquestionably a fine addition to the naval service and has some strong points, but not enough to place her far ahead of any ship of her displacement and class constructed in this country.

The American Shipmasters' Association of New York has been authorized to adopt the name American Bureau of Shipping. The association was incorporated in 1862 and its object was the collecting and disseminating of information relative to marine and commercial matters, the encouragement and advancement of worthy commanders and officers of vessels in the merchant marine service and certification of the qualifications of such officers. In the petition for the change of name it was set forth that the shipping merchant is now more concerned in the work being done by the organization than the shipmasters for whom it was originally incorporated, and that the original name had a tendency to retard its growth. One of the chief objects of the association at present is to advocate improvements in the construction and greater safety of the ships of the merchant marine.

The very favorable record made by the vessels of the United States auxiliary navy during the recent war has had the effect of inducing far greater attention by European powers generally to this branch of naval service, and in the case of several nations steps have been taken to strengthen it. Great Britain has available for auxiliary naval purposes thirty vessels aggregating 204,080 tons. Eleven of them have a speed exceeding 18 knots. In this connection it may be noted that the United States had in service during the war eighty-eight auxiliary vessels with an aggregate tonnage of 121,878 tons. They were manned by 7,155 men and mounted 548 guns.

Members of the Marine Engineers' Beneficial Association are considering the advisability of issuing cards to those firemen and oilers who have been for a certain length of time in their employ on lake steamers and have proven satisfactory. The cards will virtually amount to certificates of competency, and the object is to assist members of the order who desire to secure trusty and reliable firemen and oilers. It is a noteworthy fact that engineers have encountered especial difficulty in securing reliable men in their department, and it is believed that the plan proposed will facilitate matters materially.

The Review is pleased to announce that the controversy regarding the award of the contracts for the construction of the torpedo boats Bagley, Barney and Biddle, mention of which was made in our last issue, has been amicably settled, and that the Bath Iron Works of Bath, Me. will secure the contract. The delay was occasioned by some argument on the subject of the exact design to be followed in the construction of the boats, but the matter has been settled in a manner satisfactory to both the navy department and the ship builders.

Vessel interests on the Pacific coast are up in arms against the immense log rafts, the transit of which from Puget Sound to San Francisco has recently attracted general attention. One of these rafts containing 2,500,000 feet of lumber recently broke adrift at sea and about 50,000 feet was not recovered. This floating timber will constitute a constant menace to navigation. Vessel men on the Atlantic coast had a similar scare several years ago when rafts were being towed from Nova Scotia.

There is much of the ludicrous in the enthusiastic plan of Senor Polo y Bernabe to build a new navy for Spain, by popular subscription. No matter what expenditure Spain might make for war vessels, their engine rooms would of necessity have to be left in charge of engineers of German or other foreign nationality, and the result of such a course could not be more strikingly illustrated than by the disastrous fate of the Spanish vessels in the late war.

American commercial bodies are likely to strongly protest against any consideration by the Hawaiian commissioners of the petition of the Hawaiian Chamber of Commerce asking that the islands be exempt from the navigation laws of the United States. There is assuredly no reason

why our coasting laws should not apply to Hawaiian trade, and on the other hand every reason why they should apply to that trade.

British ship builders have broken the record this year with 598 merchant vessels of 1,364,250 tons under construction on Sept. 30, being 351,000 tons, above the previous best record, while ninety-two warships of 376,435 tons are also building. Great Britain's maritime supremacy is shown by the fact that 498 out of the 598 merchant ships are being constructed for British owners.

It is now announced that the plan for transferring the course on naval architecture from Annapolis to the Boston Technological Institute has been abandoned, and that the course will be continued at the naval academy.

## Action of Wind and Currents on Lake Erie.

Editor of the Marine Review:—In the Cleveland Leader of Saturday I noticed that another expedition had been made to the vicinity where dredgings from Cleveland Harbor have been dumped for many years, the government and city officials becoming convinced that some place must be found for the deposit of this material other than on the land, where removal by teams would increase the cost to an enormous extent. I beg leave to suggest that if this dredged material is dumped anywhere to the westward of the west arm of the breakwater, not one pound of it will ever find its way inside the breakwater. All such deposits along the shore of Lake Erie from Grand river to Huron, whether placed there by freshets or other agencies, are always carried westward, as our heavy seas and strong currents along this stretch of shore are invariably caused by northeast gales. The sea at such times stirs the bottom, which is acted upon by both current and sea, and all movable material is forced westward until a pier or breakwater is encountered. When a beach is formed on the east side, a washing out process begins on the west side, as evidenced by the beach forming east of Erie street pier and the washing out west of west breakwater. But for the riprapping below railroad property to the westward in this locality the tracks would long ago have been undermined.

At Port Stanley, Ont., across the lake, just the opposite state of things exists, as the only wind that makes a heavy sea at that point, accompanied with a strong current, is a southwest gale, which causes the filling in process there to the westward of piers and the digging out of banks to the eastward. A northwest sea makes almost square upon the shore at Cleveland, driving loose material directly thereon and making no current along the shore. This material remains until a northeaster, with its diagonal wash along the shore accompanied with strong current, carries it westward.

At Vermillion, where the shore line is about the same as at Cleveland, a very marked illustration obtains. The government east pier at that point has caught this drift from northeast sea and current, and a very extensive beach has formed for more than half a mile to the eastward. This beach is still extending its length and width, while beginning immediately west of the west pier a washing out process has been going on since the building of the pier in 1837, until hundreds of acres of land have gone into the lake. Our southwest gales produce strong currents down the lake but make no sea on shore, so that deposits are not stirred from the bottom and hence are not acted upon by the easterly current. I am thoroughly convinced that a careful examination of this subject by the government engineers and Cleveland city officials will result in solving the question of disposing of these dredgings for all time. Most of the dredgings dumped to the eastward of the harbor must eventually find their way back within the breakwater inclosure, as the water where these deposits are made is scarcely of sufficient depth to insure against the action of the heavy northeast seas and current.

JAMES STONE,

Buffalo, Oct. 10, 1898.

U. S. Supervising Inspector of Steam Vessels.

## An American Cruiser in the East.

It is seldom that there has come from press a book of travels that will possess for naval officers and marine men generally the interest that attaches to "An American Cruiser in the East," one of the new volumes in the bookstalls. This is due not only to the fact that the author is John D. Ford, fleet engineer of the Pacific station, now with Admiral Dewey, but also by reason of the descriptions given of China, the Philippines and other localities that are likely to be the scene of many interesting happenings during the next few years. The book embodies the story of a peaceful cruise, covering a period of some six years on the Pacific and Asiatic station in the gunboat Alert, and the secretary of the navy has approved of its publication.

Engineer Ford is a native of Maryland, educated in Baltimore, took the Peabody prize in the School of Design, Maryland Inst., and graduated from the Potts School of Engineering as third assistant engineer (1862). He was assigned to duty on board the Richmond of Admiral Farragut's Gulf Squadron Oct. 11, 1862, and has continued in the engineer service to date. He was ordered to start the Baltimore Manual Training School (1884-1890); to conduct the trial of the San Francisco, July, 1890; to the Alert, October, 1890, and cruised (as chief engineer) in Behring sea and on the Asiatic station for several years. In 1894 he started the department of mechanical engineering at Maryland A. and M. College; August 8, 1896, ordered to the cruiser Brooklyn; February, 1898, transferred to be fleet engineer of the Pacific station.

To naval students the most valuable feature of the work will undoubtedly be the appendix, which contains a complete critical resume of the Japanese-Chinese war, embodying such valuable information as would naturally come only to a man in the position of Engineer Ford. There are several maps and illustrations, and two valuable tables showing the strength of the navies of the respective combatants, together with all particulars regarding the various vessels.

The book contains 600 pages of text and 150 magnificent half-tone illustrations, including an excellent portrait of Engineer Ford. Published by A. S. Barnes & Co., Fifth Avenue, New York. Price \$3.



## WATER BALLASTING.

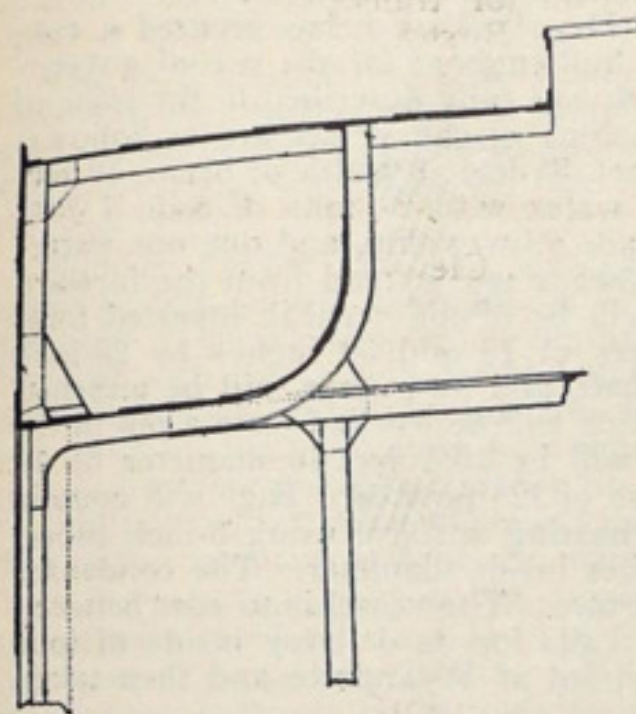
NEW PLANS DESIGNED TO PREVENT EXCESSIVE ROLLING IN SEAWAY OF MODERN CARGO STEAMERS WHEN MAKING A PASSAGE IN BALLAST.

Engineering societies in Great Britain have, during the past few years, discussed at considerable length the question of new methods of providing water ballast compartments for cargo vessels. These discussions have been followed with no little interest in this country, not only by coast

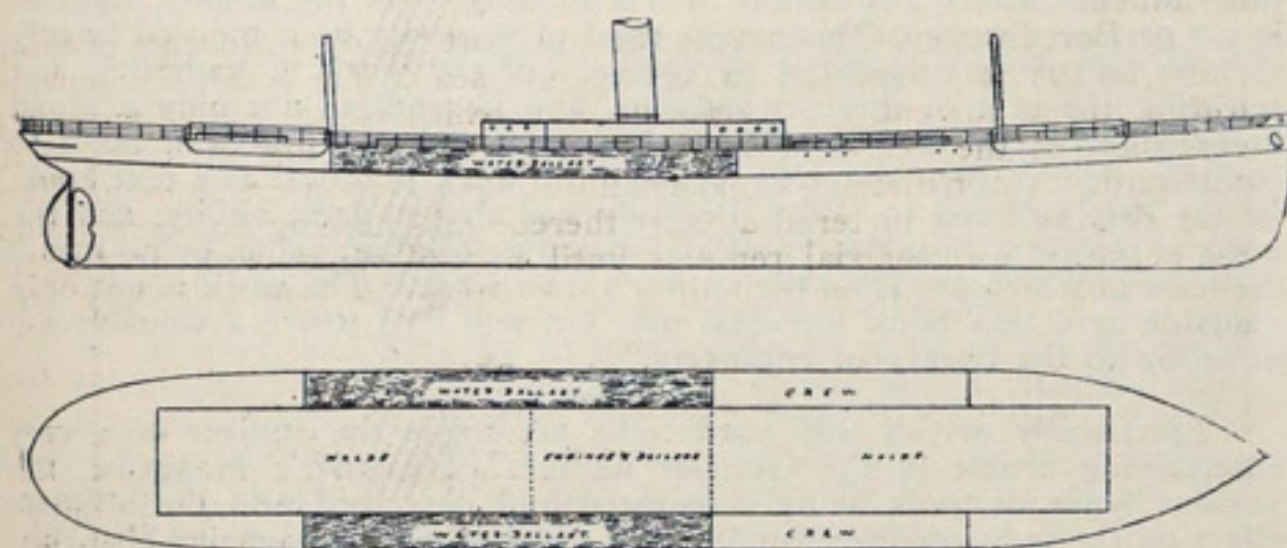
vessel owners and ship builders, but to some extent by their brethren on the great lakes, the question of obtaining the best ballasting effect without encroaching on cargo space being well nigh as pertinent to the fresh water situation as in ocean traffic.

Among the new plans recently devised for water ballasting is one for which Capt. Charles Bliault has submitted drawings to the Shipping World of London. The object of the plan is to increase the ballast-capacity of the modern cargo steamers, by placing the water ballast in tanks so disposed as to make the vessel easier in seaway and to automatically trim in such a manner as shall give the greatest possible immersion to the propeller when the ship is in light condition. It has been found in sea-

going practice, the writer says, that a considerable amount of weight can be carried with safety above the water line and upon the decks of vessels, and in fact it is generally recognized that a great and increasing number of steamers imperatively require upon their decks, a considerable amount



PLAN SHOWING POSITION OF TOP TANKS.

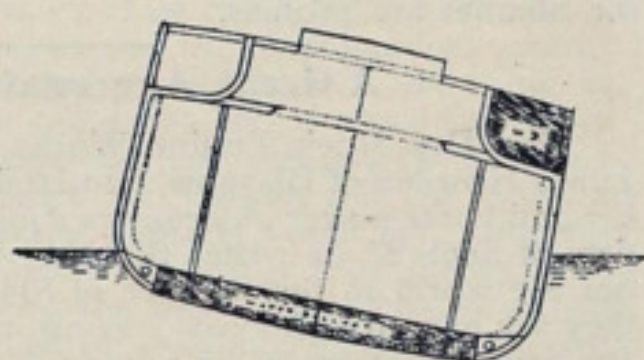


DETAILS OF CONSTRUCTION.

of ballast to render them seaworthy when light, and also to avert excessive rolling in a seaway. In a vessel constructed in accordance with the invention shown in the accompanying illustrations, from 40 to 60 per cent. of extra water ballast may be carried in addition to what is now carried in the double bottom, the extra ballast being disposed in longitudinal tanks built on either side of the vessel, as shown, and so fitted as to suit the trim and stability of the ship. The tanks, when not required for ballasting, may be used as side bunkers, or for the purpose of carrying cargo, or, in fact, for any purpose for which space may be required in a ship, watertight hatches being fitted for these purposes.

In addition to giving an increased capacity for water ballasting, a vessel so built would be a self-trimmer, thereby effecting a considerable saving in time and cost of trimming when loading coal or grain cargoes, and it would be impossible for a cargo of grain in bulk to shift during bad weather at sea. The longitudinal tanks being constructed on what is necessarily the weakest part of the vessel, converts her sides into a pair of longitudinal box-girders, thus giving the vessel immensely increased strength, an important consideration, having regard to the shallow nature of modern cargo steamers. A ship built in this way (owing to the greater longitudinal stiffness of the hull and increased immersion, due to the extra weight of ballast) would reduce to a minimum the risk of broken propeller shafts, and, by reason of the ballast being carried in the position named, would also reduce to a minimum the excessive rolling of the vessel when in ballast. In the upper deck plan of Captain Bliault's ship, which is not, however, reproduced here, a high navigating platform is also shown as being secured the whole length of the vessel, leaving no place for heavy water to lodge and wash about the decks, while the crew are berthed in the middle of the vessel, this being the safest and most convenient place, and also conduces to reduce the net register tonnage. In this arrangement of the hull's components, the maximum deadweight capacity is obtained on the minimum net register, besides giving large cubic capacity, and also plenty of deck room for conveniently working and handling cargo, whilst the cost of construction of a vessel of this type per ton deadweight capacity would not exceed that of an ordinary steamer.

As regards the question of stability, the inventor finds (after a series of experiments) that a vessel of the dimensions of those commonly built nowadays—say 330 feet long by 48 feet beam, with a draught, laden, of 20 to 21 feet and a coefficient of .77—with the double bottom full of water and an addition of 50 per cent. of the double bottom placed in the longitudinal side tanks, the metacentric height would be 5.7 feet; and with one side tank empty (as shown) the vessel would heel 11 degrees only.



HEEL 11 DEG. TOP TANK EMPTY.

It may finally be said, and it is found in general practice, that where a passage has to be made in ballast it is seldom that water can be carried in either the No. 1 ballast tank or the fore peak, owing to this weight being too far forward and tipping the ship too much by the head. By adopting the system here represented, the actual weight of ballast carried would, it is claimed, be almost doubled, as the top tanks being placed abaft, the middle of the vessel would permit of the No. 1 ballast tank and fore peak tank being carried full, and still allow the vessel to turn well by the stern, thus enabling it to make a passage comfortably, instead of as at present becoming unmanageable with every breeze that blows, falling off broadside to the sea, rolling and wallowing helplessly, a misery to all on board and a target for passing ships.

## NEW BUSINESS.

IT IS PLENTIFUL IN THE SHIP YARDS—LATEST CONTRACTS FOR MACHINERY, DREDGING AND HARBOR IMPROVEMENTS.

The sea going tug O. L. Halenbeck, building for Capt. Peter Cahill at the yard of the Neafie & Levy Ship & Engine Building Co., Philadelphia, was launched a few days ago. She is 108 feet over all, 22 feet beam and 13 feet depth. Engines will be of the compound type with cylinders 20 and 36 inches by 26-inch stroke; boilers of Scotch type, 12 feet in diameter by 14 feet long and built for working pressure of 130 pounds.

Baltimore & West Indies Steamship Co. is the name of a corporation recently organized at Baltimore to establish a line of steamers between Baltimore and the West Indies. Officers are: John S. Wilson, president; Henry A. Parr, vice-president; P. B. McLaren, secretary and treasurer.

A new building, 50 by 200 feet, is to be erected at the ship yard of George Lawley & Son, East Boston, Mass. The firm has a 93-foot side wheel steamer for C. H. Jones and Albert Stone well under way and orders have been booked for several good sized cutter yachts.

The launch of the steamer S. T. Morgan, building at the yard of the Harlan & Hollingsworth Co., Wilmington, Del., for the Virginia & Carolina Chemical Co. of Richmond, Va., took place this week. This steamer is of steel and of 2,500 tons capacity.

Torpedo boat Farragut, built by the Union Iron Works, San Francisco, made over 30 knots on a second trial trip recently, but the trial was not concluded on account of an accident to the vessel's engines.

Johnston Bros., boiler makers, and Duncan Robertson, ship builder, of Ferrysburg, Mich., are considering the advisability of co-operating in the establishment of a steel ship building plant at that place.

A saw mill at the ship yard of A. D. Story at Essex, Mass., was destroyed by fire a few days ago. The structure and contents were uninsured.

H. J. Earnest, state road commissioner of Washington, is building a steam ferry at Marcus, Wash., for service on the Columbia river.

Vineyard & Vineyard of Dover, Del., have established a steamboat line between Philadelphia and Dover, via the Delaware river.

Torpedo boats Craven and Dahlgreen, building by the Bath Iron Works, Bath, Me., are almost ready for launching.

Capt. George A. Zinn, United States engineer at Louisville, Ky., is receiving bids for the construction of a steam tender.

Edward C. Spofford, Tarrytown, N. Y., is building a steam yacht.

## DREDGING, HARBOR IMPROVEMENTS, MACHINERY, ETC.

The Chicago Pneumatic Tool Co., 635 Monadnock Block, Chicago, is doing an immense business in supplying ship building tools. Their business during September showed an increase of about 200 per cent. over the same period last year, and nearly that growth for the first eight months of the year over last year. They are just in receipt of a large number of orders from their president, J. W. Duntley, who is on the Pacific Coast, for a great variety of tools, including piston air drills, hammers and riveters.

The New York Land & Warehouse Co., New York, has been incorporated with a capital of \$1,000,000 to operate elevators and docks. Directors are: James T. Woodward and William F. Sheehan of Manhattan, William M. Barbour of Paterson, N. J., J. F. Freeman of East Orange, T. S. Orange, Elmer E. Whittaker, and T. E. Ackerson of Brooklyn.

Bids received by the government for two hand traveling bridge cranes, each of 8,000 pounds capacity and 18 feet 8 inches span, were: Reading Crane & Hoist Co., \$360.50 each; H. A. Rogers, \$323; Car Hoisting Conveying & Machine Co., \$500; New Jersey Foundry & Machine Co., \$300; Manning, Maxwell & Moore, \$335.

The Dock Board of New York has awarded Edward S. Walsh the contract for dredging 200,000 cubic yards of silt and mud deposit in the North river. Bids: Morris Cummings Dredging Co., 18¾ cents; Edward S. Walsh, 11¾ cents; International Contracting Co., 18 cents; James R. Steers, 12 9-10 cents.

It is rumored that the Midvale Steel Co., Midvale, Pa., has secured the contracts for the engines and general forgings for the three Morgan liners now under construction at the works of the Newport News Ship Building & Dry Dock Co.

The McMyler Manufacturing Co., Cleveland, has received an order for a 5-ton revolving derrick from the Lorain Steel Co., Lorain, O. The machine will be a duplicate of one recently furnished to that company.

Dredging at the head of the lakes—Duluth-Superior harbor—during September aggregated 678,291 yards. C. A. Barker, Duluth, Minn., took out 381,541 yards and E. T. Williams & Sons, 296,750 yards.

The American Steel Casting Co., Chester, Pa., has begun work on the steel cast shapes required for the hulls and engines of the Russian battleship and cruiser building at the Cramp yard, Philadelphia.

The William Cramp & Sons Ship and Engine Building Co. Philadelphia, will erect a shop 100 by 120 feet on the east side of York street between Beach and Richmond.

Bids are asked for dredging Lake Merritt, Oakland, Cal.; estimated cost \$80,000; H. W. Thomas, secretary.

The Harbor Board of Cape Town, South Africa, is in the market for movable electric cranes.



### Improvements in the Big Ship Yards.

Not only has the arousal of activity in the ship building industry resulted in the establishment in this country of several new ship building plants of considerable magnitude, but in many cases the older institutions have made arrangements to expend large sums for new and improved machinery. The Brown Hoisting & Conveying Machine Co. of Cleveland has closed contracts with both the William Cramp & Sons Ship & Engine Building Co. of Philadelphia and the Newport News Ship Building & Dry Dock Co. of Newport News, Va., for cantilever cranes of great capacity.

These electric traveling cantilever cranes will be practical duplicates and of 15 tons capacity. The length of the crane will be 180 feet over all; the arms will be 32 feet above the trestle, and the trestle 70 feet in height. It may thus be readily seen that the trestle and crane will bring the horizontal boom of the crane high enough above the pair of ship ways between which it will be erected to enable it to pass over the highest point of the ships under construction. The arms of the cantilever will, of course, project over the full width of the ships on either side of the trestle. It will be possible with these new cranes to simultaneously hoist the material, move it backward or forward on the arm, and at the same time have the whole structure travel along the trestle. The speed in the movement along the trestle will range from 400 to 700 feet per minute, and the speed in hoisting will vary from 150 to 300 feet per minute. The crane just ordered by the Cramps is the first crane to be built by the Brown company for the Philadelphia yard, but it is the fourth furnished to the Newport News works, and is practically a duplicate of its predecessors, except in the matter of minor improvements. In illustration of the degree of development attained by these machines, it may be mentioned that when the first crane furnished to the Newport News company placed 750 feet of plate girders on the ways in 4½ hours it was regarded in ship building circles everywhere as a remarkable achievement, but the demands of a wooden ship yard have so increased since that time that the Newport News company asked for a crane that could run 600 feet per minute with a load of 12½ tons. Now the Brown company is to go further and furnish a crane of 15 instead of 12½ tons capacity and of 700 instead of 600 feet maximum speed per minute.

The Cramps are also considering the advisability of further adding to the equipment of labor-saving machinery at their plant, and there is every probability that the Brown company will secure the contract. The Cleveland concern, during the past week, also made an outright sale of one of the cranes above described to a large German concern.

An order received within a few days that will necessitate the manufacture of an entirely new machine is from the Pennsylvania Steel Co. of Steelton, Pa., for an electric bridge tramway for handling rails. This tramway will be 170 feet in length and 30 feet in height and will have two parallel tracks and trolleys, thus enabling the rails to be suspended firmly and evenly instead of swinging from side to side. The Brown company some years ago built a similar tramway for the Lorain Steel Co. of Lorain, O., but it was of the single trolley type.

### Harbor Tug J. C. Evans.

A new tug of the Dunham harbor line of Chicago, or rather one of the old vessels of the fleet entirely rebuilt, is named Jas. C. Evans, in honor of the agent of the Anchor Line of steamers in Chicago. She is 90 feet long over all, 18 feet beam and 10 feet depth of hold. She is the old tug Jas McGordon entirely rebuilt, only enough of the old vessel being retained in the new to keep her original shape and model. This was accomplished by taking out one frame at a time and replacing it. The Evans is 4 feet longer and 15 inches deeper than the old tug. She has iron deck frames and shelf pieces, and a new departure is a so-called log rail, which is built just on top of the plankshire, doing away with all stanchions and stringers. This log rail is 13 inches high from the deck and is built up solid by placing pine timbers one on top of the other, decreasing in width from 10 inches at the bottom to 8 inches on top, with a 4-inch oak rail on top of this. The Evans also has iron cleats and tow-posts. Her engine is high pressure, 24½ inches diameter and 26 inches stroke, with a universal coupling on the shaft and an independent feed pump, another new departure in high pressure tugs. She has a new steel fire-box boiler, 12 feet long and 7½ feet in diameter, with two furnaces, allowed 160 pounds of steam. The tug has steam steering gear. All doors of cabins and pilot house are of iron and slide on the outside, a great improvement on the old style wooden doors. Roofs of deck houses, coal bunkers, lamp screens, and bunks for the crew are also of iron, and in fact everything destructible or needing durability is of iron. She has a concave rudder, 10½ feet long and 8 feet wide.

With freight rates climbing up to a highly profitable basis, two good wooden ships, the steamer J. H. Outhwaite and consort H. A. Barr, remain tied to a dock in Detroit, where they have been ever since the owners, W. C. Richardson and others of Cleveland, refused to accept them, early in the season, after they had gone ashore and had been repaired by the McCurdy-Prime insurance syndicate of Chicago. One interest is still claiming that the other owns the vessels. The owners abandoned them and therefore will have nothing to do with them. The underwriters repaired them and have insisted, since the repairs were made, that the ships, returned as they say in as good condition as they were before meeting with accident, must be accepted by the owners. It is understood that there has been some spicy correspondence going on between the two interests. When this matter comes up for hearing in court it will attract more attention than any legal action that has taken place on the lakes for a long time past.

"I was very much interested," says a subscriber to the Review, "in your account of the performance of the Annapolis during the war, contained in the issue of the 6th. It might not be uninteresting to note that this vessel is entirely equipped with Davidson pumps—Independent air pump. The air pump, which is one of the best I have ever had anything to do with, is a duplicate of one that has been in actual service eight years in the United States practice ship Bancroft, and which has not cost one cent, except for renewal of water valves and stuffing-box packing."

### Lake Ship Building Matters.

All builders of steel ships on the lakes are engaged in a great deal of figuring for new cargo carriers, as a result of general improvement in lake freights, but any contracts for large vessels, other than those noted a week ago, have been closed. Capt. James Davidson of West Bay City has announced, since returning home, his intention to build on his own account two wooden schooners the coming winter, to be duplicates of the schooners Chickamauga and Chattanooga, which he built last winter. They will be 335 feet long, 45½ feet beam and 26 feet moulded depth. They will carry about 160,000 bushels of wheat or 4,000 gross tons of ore.

It is announced that the Detroit Dry Dock Co. has secured a contract for the construction of the steel hull tugboat for the use of government engineers on Puget Sound, which was fully described in the issue of the Review of Sept. 8. The dimensions of the vessel are as follows: Length on deck, 94 feet; length on keel, 85 feet; breadth of beam, 19 feet 6 inches; depth, 11 feet; draught of water with 20 tons of coal, 7 feet. There will be three watertight bulkheads athwartship, and one not watertight. Fore and aft coal bunker bulkheads will extend from the forward boiler room bulkhead. The engine will be of the vertical, inverted fore-and-aft compound type, with cylinders of 15 and 30 inches by 20-inch stroke. There will be a built crankshaft, and no pumps will be attached to the engine except a bilge pump, which will be worked from a pin in the front end of the shaft. The boilers will be 10½ feet in diameter by 10 feet in length, with a working pressure of 125 pounds. They will contain at least 1,000 square feet of effective heating surface, using 3-inch tubes, with two Morrison furnaces of 40 inches inside diameter. The condenser will have 500 square feet of cooling surface. The vessel is to cost between \$30,000 and \$40,000, and the contract calls for its delivery inside of four months. This tug will be built and tried at Wyandotte and then taken apart and shipped by rail to Seattle.

### Thermodynamics of the Steam Engine.

We take pleasure in acknowledging the receipt of a copy of the fourth edition of a text book on Thermodynamics of the Steam Engine, by Cecil H. Peabody, professor of marine engineering and naval architecture, Massachusetts Institution of Technology. As the author suggests in his preface a work of this nature must of necessity be composed largely of laws and rules originated by others, but the work of gathering and selecting the best of these is arduous, and it requires not only a broad knowledge of the several subjects but a trained and practiced mind to compile them in such shape as to make the work practical as a text book. In the case referred to, Prof. Peabody has shown great ability, and the book is replete with tables, rules and formulae of great value, by no means the least of which are from the author's own work. The work is not only valuable as a text book for class use, but will also prove a valuable acquisition to the library of engineers.

Electrically driven ship yard tools are made the subject of a very entertaining article in the October number of Cassier's Magazine, the various types of tools being illustrated and described and the ultimate effect on the industry forecasted. This number of the magazine also contains several other articles on maritime subjects, among them a treatise on "Torpedo Boats in Modern Warfare" by Capt. William H. Jaques.

The October number of the Review of Reviews is given over pretty largely to a discussion of the late war in its various phases, and the naval phase of it has by no means been overlooked. An article "William McKinley as War President" is instructive, and the illustrations throughout the number are profuse.

### A Great Aggregate of Horse Power.

The Dry Dock Engine Works, Detroit, received a letter from Mr. James Howden of Glasgow, Scotland, a few days ago, regarding the number and horse power of steamers equipped with Howden hot draft. Under date of Sept. 27, he writes that they have now total installations throughout the world to the number of 814 with 2,277,300 I. H. P. At present they are exceedingly busy, having more orders in hand than ever before. Referring to steamers of unusually large power, Mr. Howden mentions the following lines as among customers that are building new vessels, on which the draft is to be applied: Cunard Line, Pacific Company, Orient Company, P. & O. Co., Atlantic Transport Co., Anglo-American Oil Co., Allan Line, Austrian Lloyds, Hamburg-American Line, North German Lloyd Co., Russian Volunteer Fleet, French Line, Rotterdam Lloyd, Netherland Company, etc. The list of vessels on which Howden draft has been installed by the Dry Dock Engine Works, or for which orders have been received, now numbers fifty-seven, and the total I. H. P. is 71,250.

A comparison between the new dock just begun by the Newport News Ship Building & Dry Dock Co., and a similar structure nearly completed by the Glasgow (Scotland) Graving Dock Co. may not be uninteresting. The dimensions of the two docks are: Length of basin—Newport, 800 feet; Glasgow, 880 feet. Breadth at bottom—Newport, 80 feet; Glasgow, 81 2-3 feet. Breadth at top—Newport, 148 feet; Glasgow, 115 feet. Depth from top of sill—Newport, 41 feet 8 inches. Draft at low tide—Newport, 34¼ feet. The Newport dock will permit the entrance of a ship drawing 29¼ feet, and the entrance is 106 feet wide at top and 80 feet wide at bottom. It is built of concrete backing with granite facing. The Glasgow dock will admit ships of 26 feet 6 inches draft, and the entrance is 86 feet wide with vertical sides.—Army and Navy Journal.

Frederick A. White and William Bates, two notable English underwriters who have been in this country for a couple of weeks past in consultation with heads of the principal American marine insurance companies, as well as representatives of foreign companies doing business here, sailed for England on the 13th inst. The object of their visit was to encourage co-operation in this country with the movement in England for higher rates of insurance. The visitors were highly entertained by the American Institute of Marine Underwriters, recently formed in New York.



## Trade Notes.

The Joseph Dixon Crucible Co., one of the best known concerns of its kind in the world, was established away back in 1827.

The Berlin Iron Bridge Co., East Berlin, Conn., is furnishing a bridge to the town of Somerville, Somerset county, N. Y., and the steel roof for the storehouse of the Laflin & Rand Powder Co., Prompton, N. J.

The C. H. Haeseler Co., Philadelphia, manufacturers of pneumatic tools and other appliances for ship and engine building works, are removing from 1026-30 Hamilton street to much larger quarters at the southeast corner of Hamilton and Twelfth streets.

The B. F. Sturtevant Co., Jamaica Plains, Boston, Mass., has just issued two very neat illustrated pamphlets describing fully the Sturtevant patent steam hot blast apparatus and illustrating the uses to which it may be put. Persons interested will be repaid for a perusal of the little booklets.

Bement, Miles & Co., well-known manufacturers of ship and engine building tools, are making a specialty of single frame steam hammers. The arrangement is simple in the extreme. The valve gear, arranged with the least possible number of moving pieces, takes up its own lost motion by gravity and hence will control a hammer with great uniformity for a much longer time than would otherwise be possible. The patent adjustable guides for taking up the wear of the ram are an important addition. Particulars of these hammers may be had from the Chicago office of the company or from the main office at Philadelphia.

A German sailing vessel, the steel ship Mabel Rickmers, has just cleared from Norfolk, Va., for Cape Town with 3,100 tons of Pocahontas coal, generally understood to be for the use of the British navy. British interests are endeavoring to keep secret the extent of the foothold which Pocahontas coal has gained in that country. Castner, Curran & Bullitt of Philadelphia, agents for this coal, have opened a new coaling station at Buenos Ayres, Argentine Republic. Mr. Carl Hugo Arnal, who has been connected with the company for a number of years, and who is also vice-consul for Venezuela and Columbia at Norfolk, will go to Buenos Ayres as agent. A large number of ships will shortly sail to Buenos Ayres with cargoes of coal.

Incidental to its account of the meeting of the American Society of Civil Engineers at Detroit, Engineering of London took occasion to describe the steamers North West and North Land, built by the Globe Iron Works Co. of Cleveland and paid a well deserved compliment to the Cleveland City Forge & Iron Co. Engineering says: "It may be said that the forgings in these splendid steamers were made by the Cleveland City Forge & Iron Co., and when that is said, it only remains to add they are the finest to be had. This company furnished the rudders for the new ships in our navy, and they are as fine a piece of work as can be made. That was probably one reason the guns were so well aimed, since the ships steered so accurately when chasing Cervera's fleet. If that shell which hit the San Francisco in the stern had struck one of this company's rudders it would have, perchance, fallen into dust. All the forgings of the Fall River Line's fine fleet were made by this same company."

At a recent meeting of the engineers' club of Cleveland, Joseph R. Oldham devoted a part of a paper which he had prepared for the occasion to notes about the congress of naval architects and marine engineers held in England a year ago. In referring to an address made by Mr. Goshen, first lord of the admiralty, at one of the great dinners given in London in connection with the congress, Mr. Oldham takes occasion to extend a few compliments to Sir Edward J. Reed, ex-chief constructor of the British navy. Mr. Goshen sincerely complimented the ship builders assembled from all parts of the world, but he had to tell them of one thing in connection with naval architecture they could not do; it was a miserable little physical defect they had never mastered—they had not yet designed a vessel to prevent sea-sickness. "Perhaps Mr. Goshen had Sir Edward J. Reed in mind when he made this latter remark," says Mr. Oldham, "for, if I am not mistaken, it was no less a personage than the ex-chief constructor of the British navy who, when the writer was a boy, designed a large passenger steamer with suspended or swinging cabins to prevent mal de mer. I think the scheme proved anything but a success. Still the Welsh proverb teaches us that 'failures are the pillars of success,' and in this case the proverb proved literally true, for today there is not a naval architect more highly thought of than the same Sir Edward. His services to the body of naval architects and ship builders of the wide world have been liberal and grand in the extreme. There are many elegant writers among the naval architects, such as Elgar, White, Barnaby, Martell, Gray and Milton, but none, I verily believe, so justly popular as Sir Edward, and none more honorable."

G. O. Herbert, a Lloyd's inspector formerly stationed at Glasgow but who has just been transferred to Pittsburg, is quoted in a Pittsburg paper as follows: "The steel furnished by the Carnegie company has so far been of an exceptionally good quality and has compared very favorably with the British product. Of course, the American article is the cheaper, or it would not sell abroad. The introduction of American steel is becoming rather general in the United Kingdom, and I see no way of meeting your competition, unless radical means are found for reducing the price of the English product."

Vessel men in different parts of the lakes have sent protests to government officials against the removal of Capt. Frank Danger, hull inspector at Port Huron. It is understood that an effort was being made in political circles to remove Capt. Danger, but the change will not be made if the vessel men, who are against political influence in the inspection service, can prevent it.

Abram Smith & Son now have undergoing repairs at their yard at Algonac, Mich., the schooners Thomas H. Cahoon and Montgomery, injured in collision with whaleback No. 137. The repairs on the Cahoon are almost completed and the Montgomery will be ready to leave the yard on the 22nd inst.

## Greatly Pleased with the Baldt Anchor.

Baldt Anchor Co., Chester, Pa. Gentlemen:—Yours of no date to hand some time ago. I could not answer it and give you the information you wanted about the Anchor, as I had not used it, but I can give you the needed information today, for yesterday we had a hurricane here, and I was anchored in the Savannah river, 6 miles below the city, and used the Anchor we ordered from you. The wind was blowing over 60 miles an hour. We used only the one anchor with 35 fathoms of chain, and it held us. We were anchored in 4½ fathoms of water. Vessels in the river dragged with two anchors and went ashore, while we only used one (the one we ordered from you). I think this speaks for itself. I would not have any other if I can get your make. My vessel is the steam pilot boat John H. Estill. Her tonnage is 245 gross. She is engaged in pilotage for the port of Savannah. Her length is 130 feet. You know that we can depend on the anchor, as we used only 35 fathoms of chain, when we have 90 fathoms for each anchor. Any further information I can give you will be gladly furnished.

WALTER J. THOMPSON.

Savannah, Ga., Oct. 3, 1898.

The highest development of the science of successful advertisement writing is supposed to be embodied in the ability to construct an announcement, all of whose salient features shall be comprehended at a glance. This has never been more clearly demonstrated than by a card just issued by the Boston & Lockport Block Co. of 142 Commercial street, Boston. If its purpose be to impress permanently on the mind of the recipient the nature and character of the goods handled by the institution, it will assuredly be accomplished. As an illustration of simplicity and directness in a business announcement it is perfection.

Joseph S. Hayes, well known as chief engineer of the Zenith Transit Co. (Wolvin fleet of steamers, which are among the very largest freighters on the lakes) writes the United States Metallic Packing Co. of Philadelphia as follows: "I have your packing on the Zenith City and Queen City carrying 225 pounds of steam, and on the Crescent City, Empire City and Superior City carrying 250 pounds steam pressure, and it is working first rate on all these steamers this season. I do not know what we would do without it in view of the high pressure."

The request recently forwarded to the Canadian department of marine and fisheries by Capt. George P. McKay, chairman of the committee on aids to navigation of the Lake Carriers' Association, for the stationing of sufficient black spar buoys to mark the west side of the Bar Point channel in the Detroit river has been granted, and Capt. McKay has been notified that seven buoys of this description have been placed in position. The east side of the channel has been, for some time past, marked by red buoys.

The fitting out of the distilling ship Iris and supply ship Celtic will delay the departure of the battleships Iowa and Oregon for Manila until next week.

## Chas. E. &amp; W. F. Peck,

58 William St., NEW YORK CITY.

Royal Insurance Building, CHICAGO, ILL.

## C. T. BOWRING &amp; CO.,

5 and 6 Billiter Avenue, E. C., LONDON, ENG.

## INSURANCE

BROWN & CO., . . . 202 Main Street, Buffalo, N. Y.  
PARKER & MILLEN, 15 Atwater St., W., Detroit, Mich.  
J. G. KEITH & CO., 138 Rialto Building, Chicago, Ill.  
LA SALLE & CO., Board of Trade Bldg., Duluth, Minn.

Are prepared to make rates on all classes of Marine Insurance on the Great Lakes, both CARGOES and HULLS.

## Great Lakes Register,

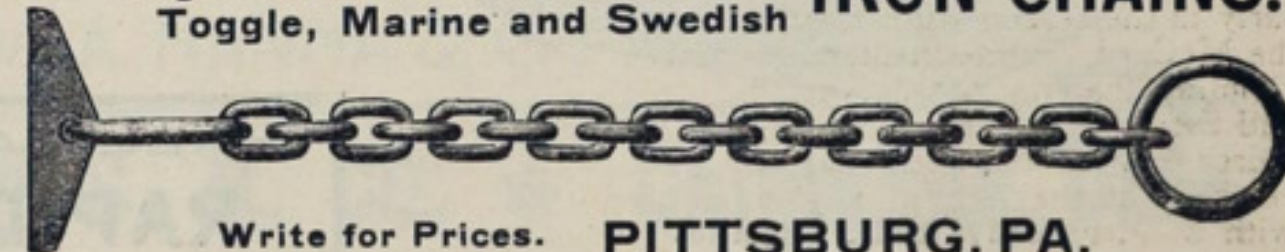
Combined and issued in connection with BUREAU VERITAS International Register of Shipping.

F. D. HERRIMAN, Surveyor-General, Chicago, Ill.

## JAMES MCKAY &amp; CO.

Manufacturers of all kinds of

High Grade Boom, Rafting, **IRON CHAINS.**  
Toggle, Marine and Swedish



Write for Prices. **PITTSBURG, PA.**

## BUILDERS OF LAUNCHES AND OTHERS needing Cast Brass, Bronzes and similar metals. Want to hear from you. Want to furnish you with

Boat Trimmings, Propeller Blades, Wheels,

Engine Bearings, and other things.

Can furnish the rough castings or completed parts, polished or nickel plated. No one better equipped. Skilled workmen. Clean solid castings. A No. 1 quality. Now is a good time for manufacturers to make contract—later on may be too late. We might consider taking hold of good specialty on our own hook

Write

**STANDARD BRASS WORKS, Kalamazoo, Mich.**



## The Bessemer Steamship Company

Solicits Catalogues, Prices and Discounts from manufacturers and wholesale dealers in Ship Machinery, Brass Goods, Rope, Paints, Asbestos, Packing, Hose, Furniture, Piping, Glass and Crockery, Tinware, Ranges, Carpeting, Bedding, Life-preservers, Rafts and Boats, Engineers' Supplies and Tools, Carpenters' Tools, Electric Supplies, Lamps, Grate Bars, Castings, etc., etc., etc.

ALSO QUOTATIONS from Market men and Grocers on the Lakes for Provisions and Meat, best quality only.

CATALOGUES without quotations are not wanted.

ALL GOODS except provisions to be delivered in Cleveland.

Address L. M. BOWERS, General Manager,  
CLEVELAND, OHIO.

## Newport News Shipbuilding & Dry Dock COMPANY.

**WORKS AT NEWPORT NEWS, VA.**  
(On Hampton Roads.)

Equipped with a Simpson's Basin Dry Dock capable of docking a vessel 600 feet long, drawing 25 feet of water, at any stage of the tide. Repairs made promptly and at reasonable rates.

### SHIP AND ENGINE BUILDERS.

For estimates and further particulars, address

**C. B. ORCUTT, Pres't,**  
No. 1 Broadway, New York.

INCORPORATED 1794.

## Insurance Company of North America.

**CAPITAL, Paid up in Cash, - - \$3,000,000.00**  
**ASSETS, - - - - - 10,023,220.93**

CHARLES PLATT, President.

EUGENE L. ELLISON, Vice-President.

JOHN H. ATWOOD, Assistant Secretary.

GREVILLE E. FRYER, Sec'y. & Treas.

T. HOWARD WRIGHT, Marine Sec'y.

GEORGE L. McCURDY, Manager.

CHICAGO, ILLS.

Lake Marine Department.

## THE MANHATTAN RUBBER M'FG CO.

FACTORIES—Passaic, N. J.

HEADQUARTERS—18 Vesey St., N. Y.

BRANCH SALESROOMS

No. 212 Champlain St., CLEVELAND, O.

W. D. ALLEN, 151 Lake St., CHICAGO, ILL.

MANUFACTURERS OF

High Grade of Marine Valves, Sheet and Piston Packings,  
Deck, Steam and Fire Hose of every description CARRIED IN STOCK.

## Youghiogeny River Coal Co.,

MINER AND SHIPPER OF

**OCEAN MINE** YOUGHIOGHENY **GOAL.**  
GAS and STEAM

General Office, ERIE, PA.

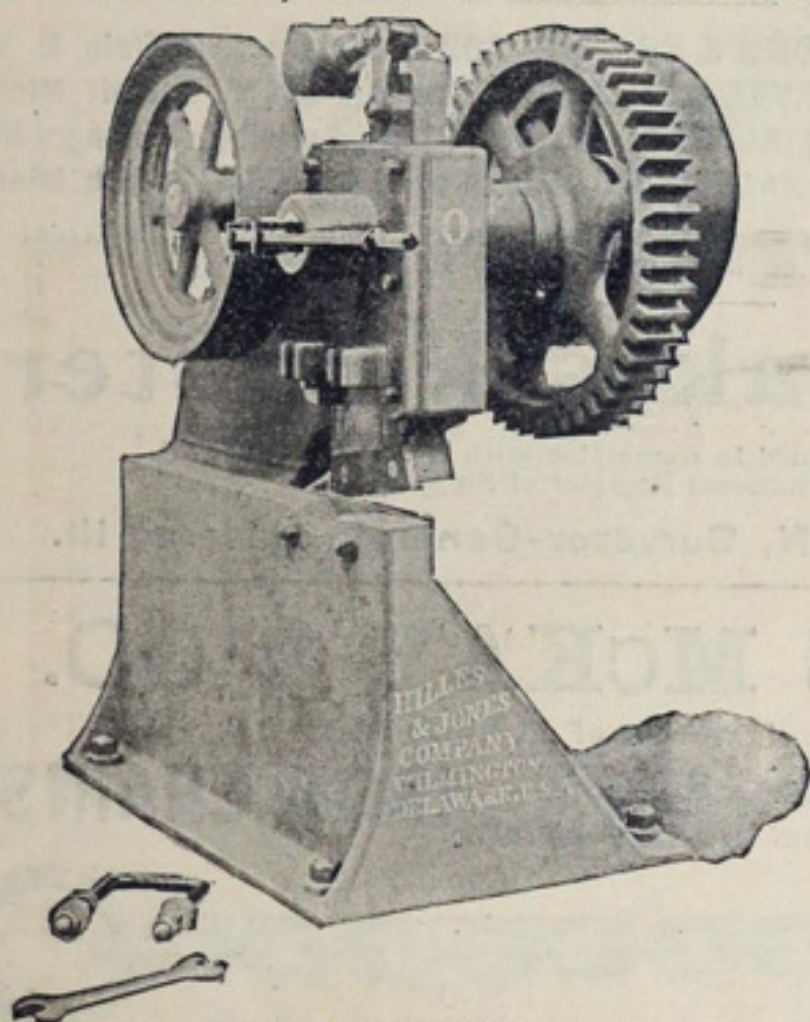
Long Dist. Tel. No. 409.

Shipping Docks, ASHTABULA, O. " " " " 76.

**VESSELS FUELED** at all hours with **OCEAN** Coal only, by Steam Lighter or Car Dump. Electric Light.

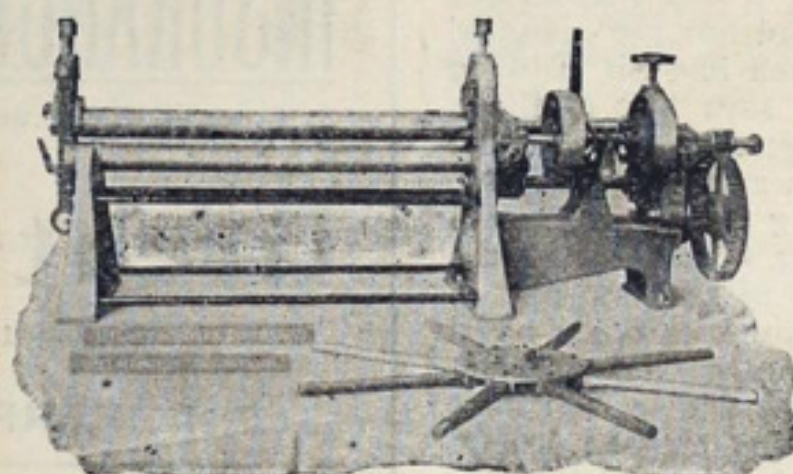
# IMPROVED QUICK-ACTING MACHINE TOOLS FOR STEEL SHIP YARDS, BOILER WORKS, ETC.

PUNCHES, SHEARS. BENDING-FLANGING AND STRAIGHTENING MACHINES, PLATE PLANERS, GARBOARD STRAKE BENDERS.



UNIVERSAL SHEARS.

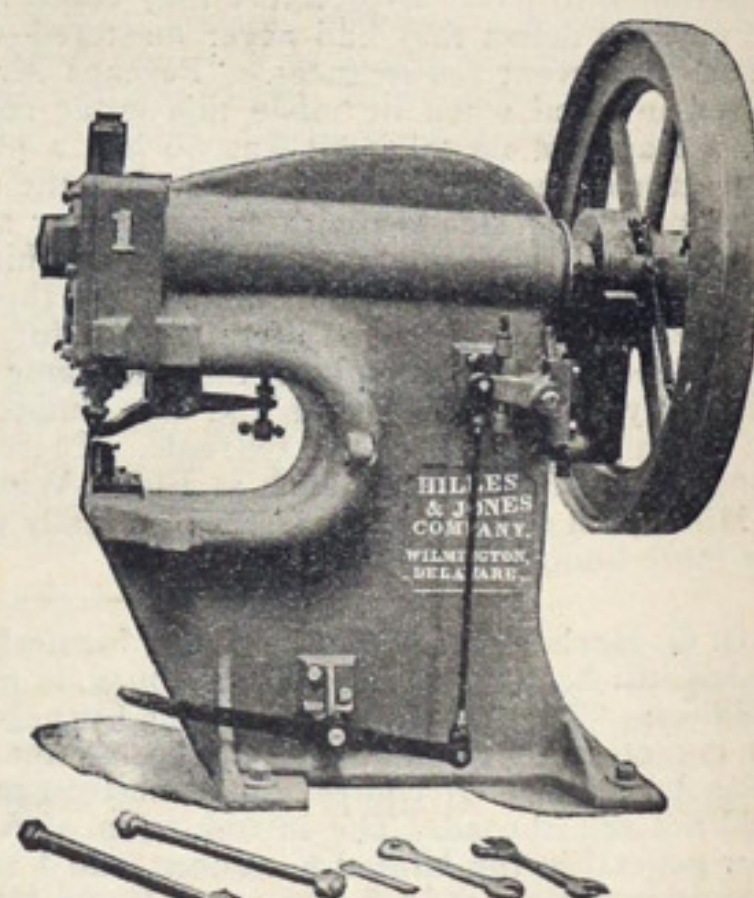
For splitting plates of any width. Machines of this same design are built for work up to 1 inch in thickness. Main frames are made of steel to give ample clearance for the plate passing through and yet provide ample stiffness and strength.



LIGHT PLATE BENDING ROLLS.

Made any distance between the housings. Driving is done through duplex friction clutch pulleys to avoid shifting of belts. Top roll has a solid extension for counterbalancing and the back housing hinges to allow removal of plates bent to full circles.

THREE MACHINES FOR  
**RAPID WORK**  
ON  
STACKS, MASTS, VENTILATORS, ETC.



QUICK-RUNNING PUNCH.

Intended for light work and for the convenient handling of structural material. Speed of the machine is about 75 strokes per minute. Die block is close to the front for convenience in handling light angles. Lighter and heavier machines of this same design are furnished.

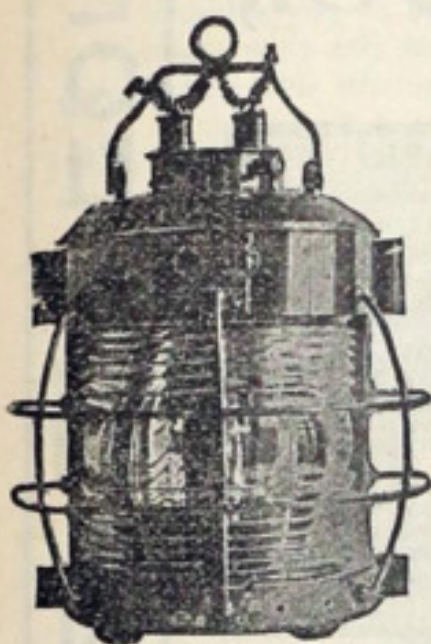
PHOTOGRAPHS, CATALOGUES AND  
FULL DISCRIPTIONS MAILED ON  
APPLICATION.

## HILLES & JONES COMPANY,

912 CHURCH ST. Wilmington, Delaware.

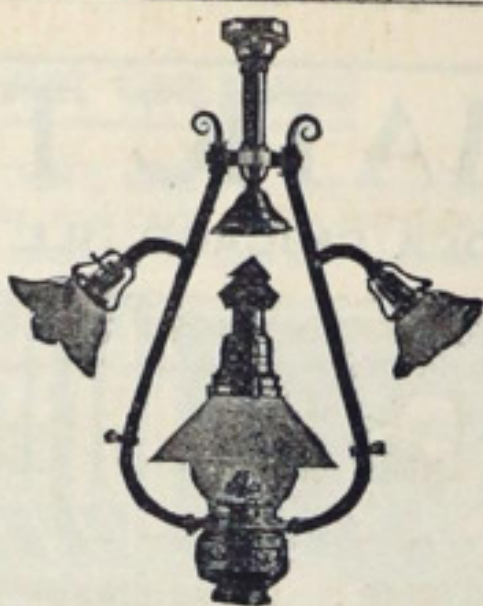


# MARINE LAMPS



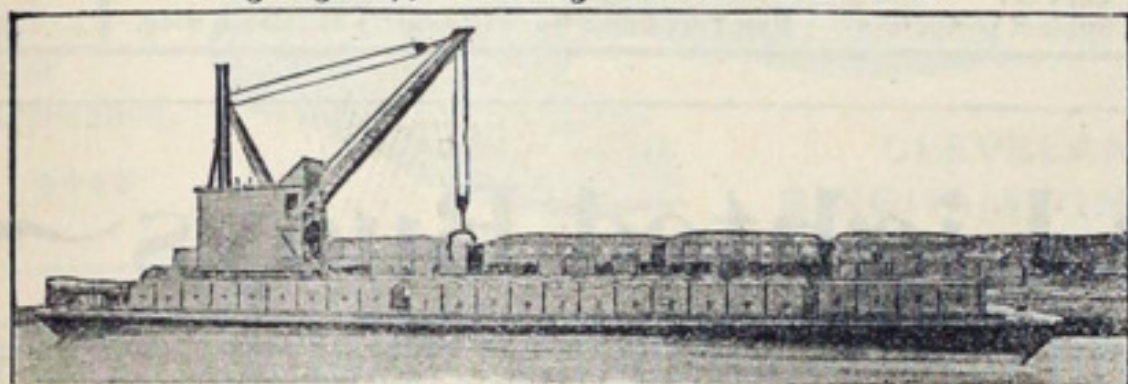
Oil and Electric  
Equipment for  
Steamships,  
Yachts, etc.

Signal Lights,  
Saloon Fixtures,  
Cabin Lamps,  
Lanterns, etc.



**Wm. Porter's Sons,**  
271 Pearl St., NEW YORK CITY.

**FUEL FOR STEAMERS AT CLEVELAND AND CHICAGO**  
Youghiogheny, Pittsburg and New River Coal.



Fuel Lighter at Cleveland, O.

**THE PITTSBURGH & CHICAGO GAS COAL CO.**

J. A. DONALDSON, Mgr. N. J. BOYLAN, Dock Mgr.

Latest Dock and Lighter equipment for rapid fueling.

**FUEL DOCKS**—River Bed, through Valley Railway  
Bridge and Foot of West River St., CLEVELAND.  
**LIGHTER**—With 150 2½ ton buckets (400 tons capacity.)

TELEPHONES: { Main Office—Main 1888.  
Fuel Dock Office—West 190.

420-421 PERRY-PAYNE BUILDING, CLEVELAND, OHIO.

**YOUGHIOGHENY & LEHIGH COAL CO.**

JOHN T. CONNERY, Mgr. ARCHIE J. HITCHCOCK, Dock Supt.

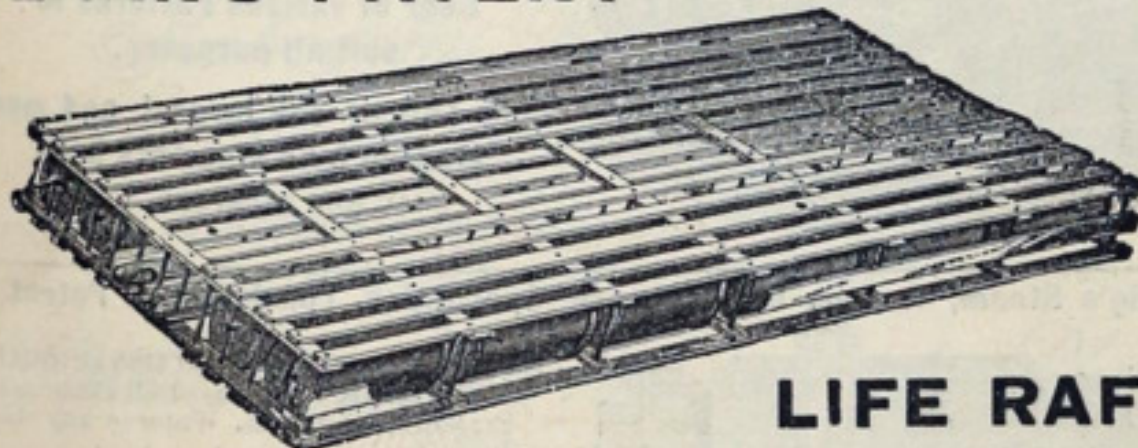
**FUEL DOCKS**—No. 1, Michigan Slip and Basin; Phone —  
No. 2, North Halstead St. Bridge. Phone 773 North.

**LIGHTER**—Equipped with 125 two ton buckets for fuel-  
ing anywhere in harbor of . . . . . CHICAGO.

Main Office, 1238-1242 Chicago Stock Exchange Building,

110 La Salle Street, Chicago, Ill. Long Distance Telephone, Main 5049.

## CLARK'S PATENT



**LIFE RAFT.**

COPPER AND HEAVY SHEET IRON WORK,  
MCCOY LUBRICATORS, BRASS MARINE WORK.  
STEAM FITTING, ENGINEERS' SUPPLIES.

**DETROIT**

**SHEET METAL AND BRASS WORKS.**

FOOT OF ORLEANS STREET. OPEN DAY AND NIGHT.

## The Rochester & Pittsburgh Coal & Iron Co.

**REYNOLDSVILLE COAL.**

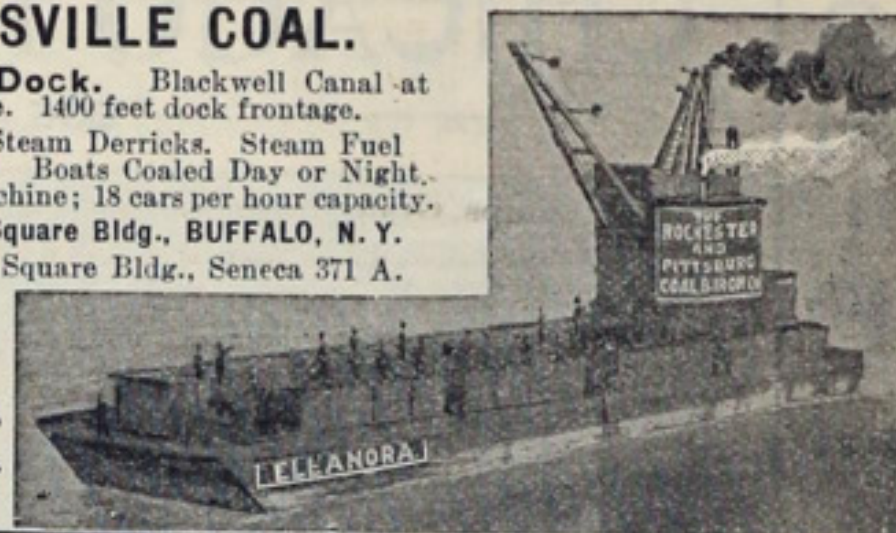
**Steamboat Fuel Dock.** Blackwell Canal at  
Michigan St. Bridge. 1400 feet dock frontage.

Steam Elevator and 4 Steam Derricks. Steam Fuel  
Scow, Capacity 550 Tons. Boats Coaled Day or Night.  
Modern Car Dumping Machine; 18 cars per hour capacity.

OFFICE: 694 Ellicott Square Bldg., BUFFALO, N. Y.

TELEPHONES: Ellicott Square Bldg., Seneca 371 A.  
Dock, Seneca 371 D.

Capt. WM. H. HAZEN,  
Dock  
Superintendent.



## The Roberts Boiler Co.

Have built about 1000 BOILERS TO DATE for

Launches, Yachts, Passenger and Freight Steamers, Dredges, Tugs, Stern-  
Wheelers, Canalers; also for Navy Department, War Department, Treasury  
Department, Light-House Board and Revenue Cutter Service; also for N.  
Y. Dock Department and U. S. Supervisor, Harbor of N. Y.

**SAFETY AND ECONOMY.**

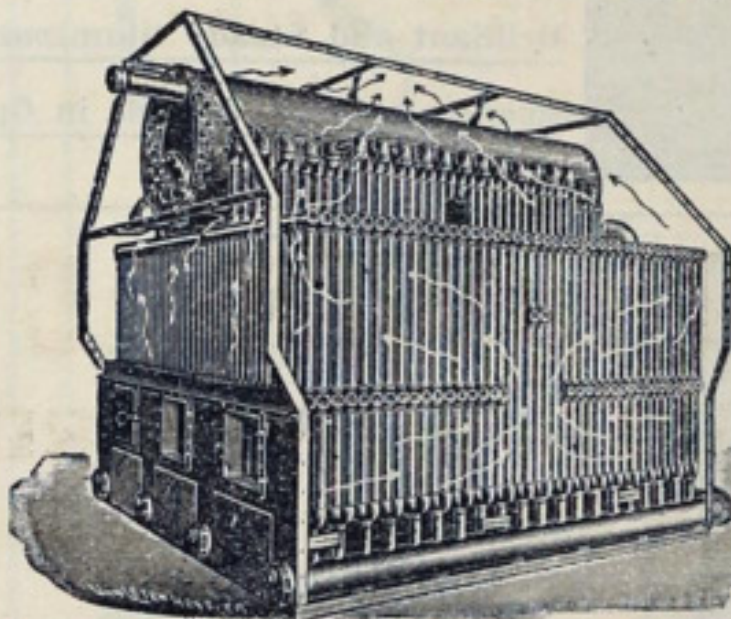
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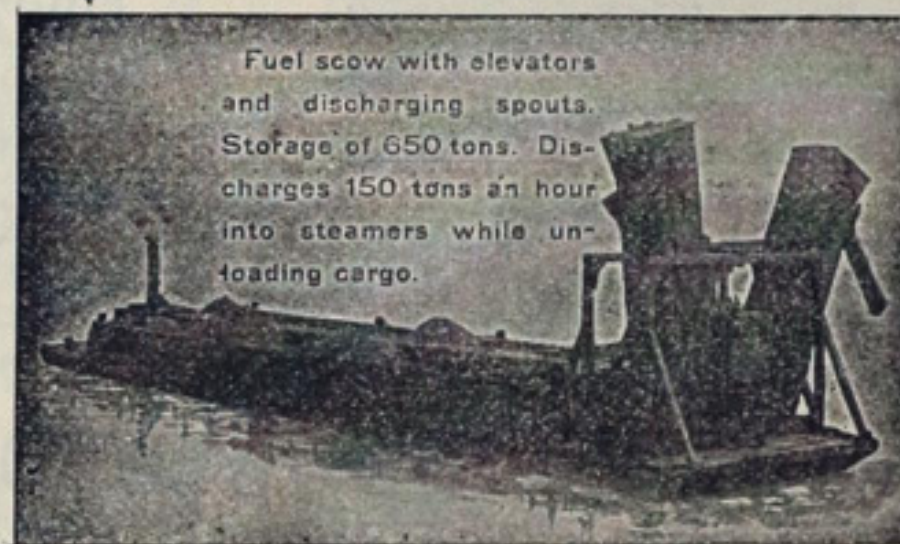
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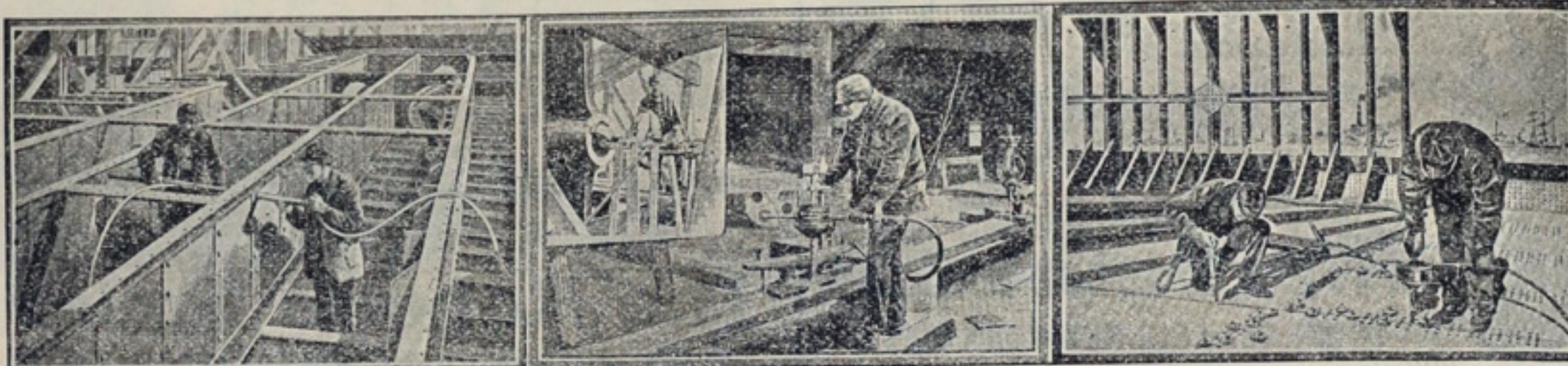
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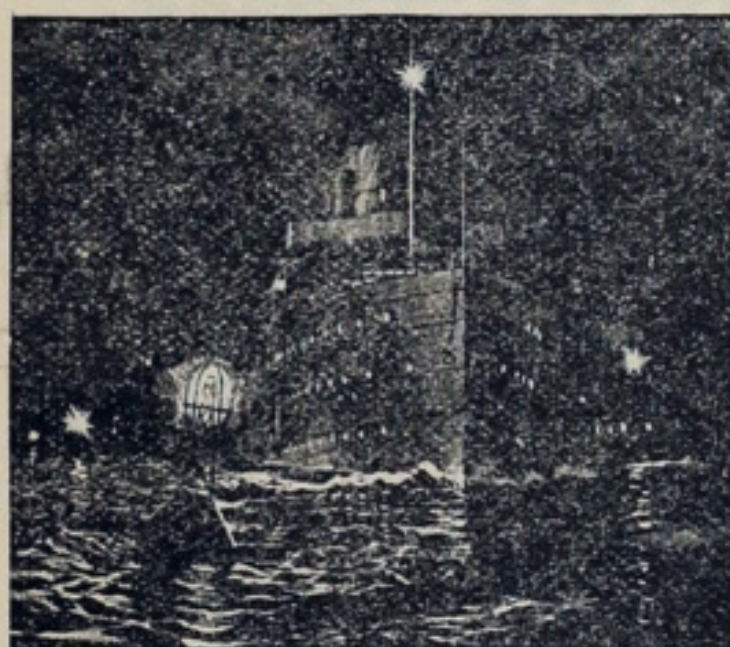
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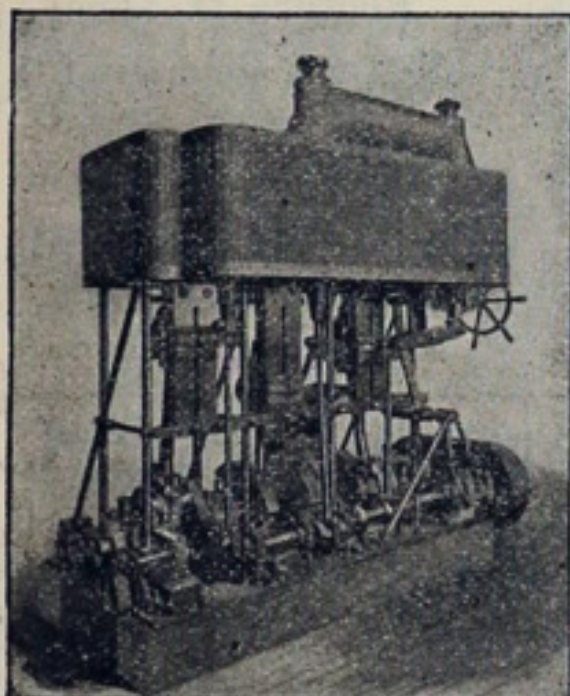
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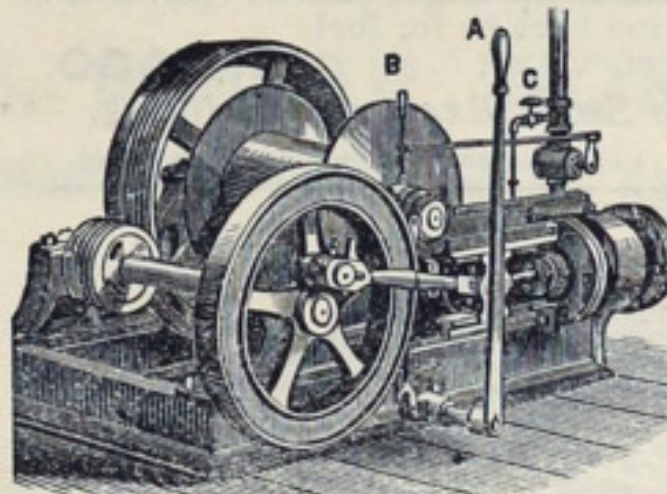
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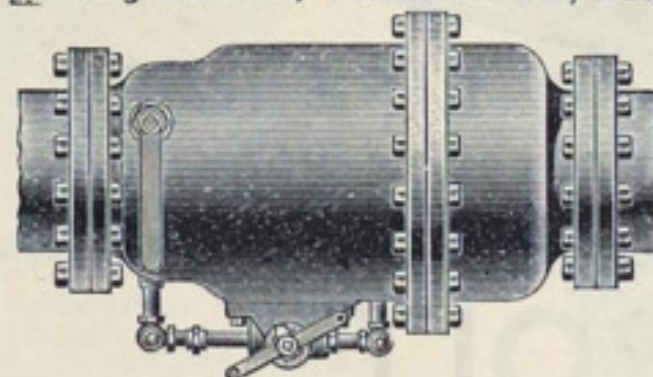


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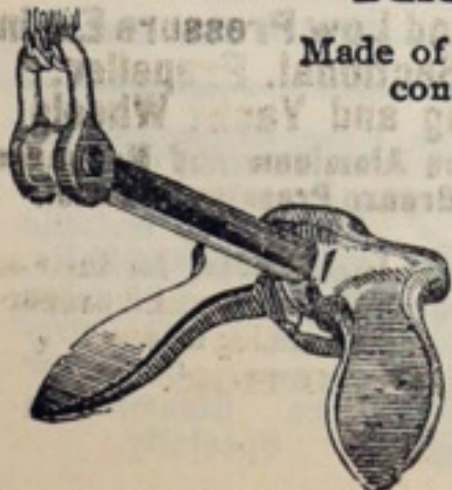
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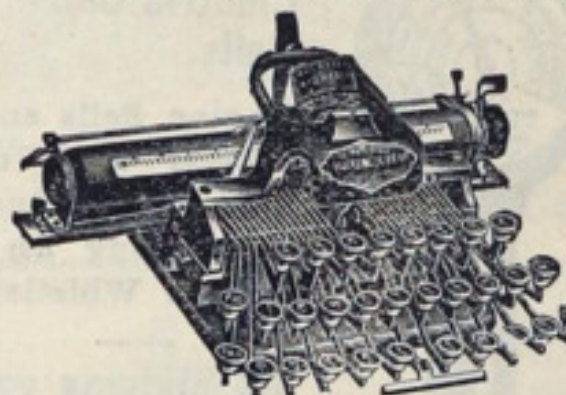
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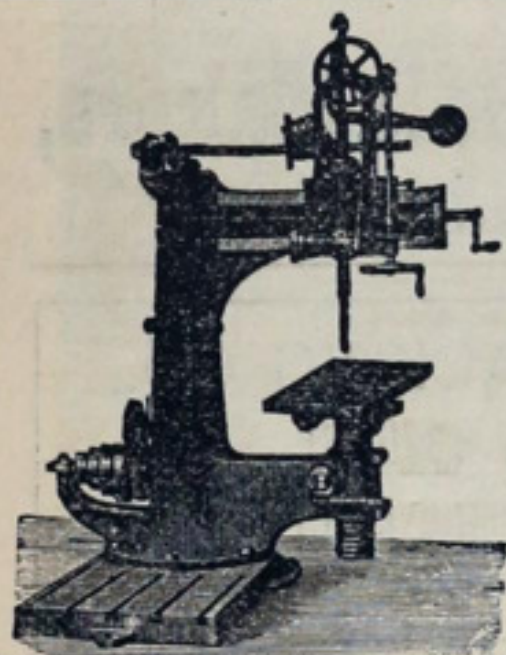
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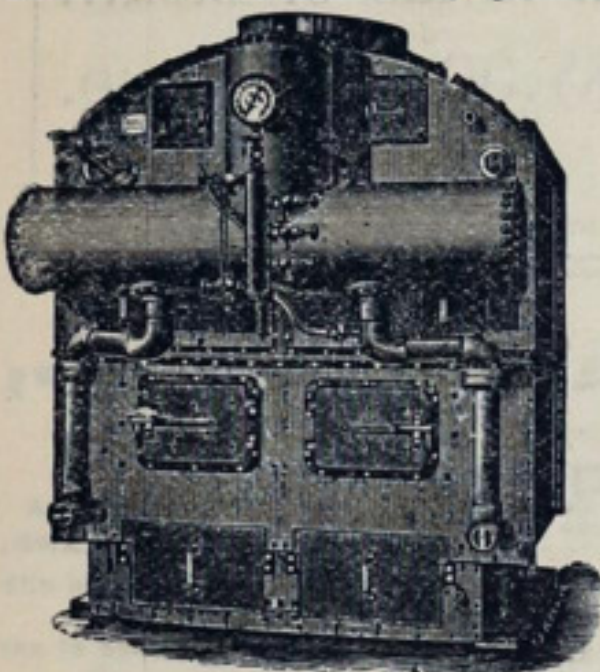
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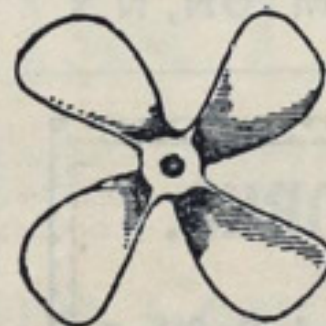
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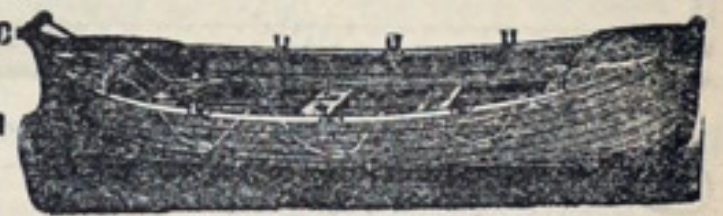
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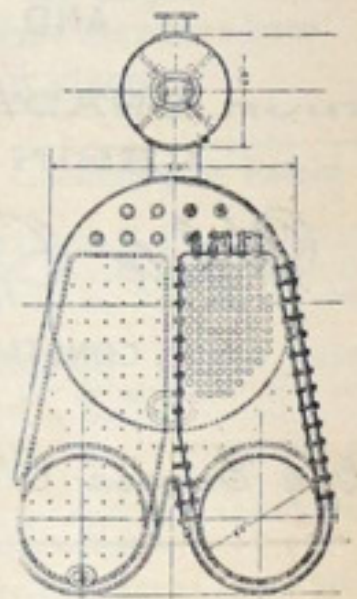
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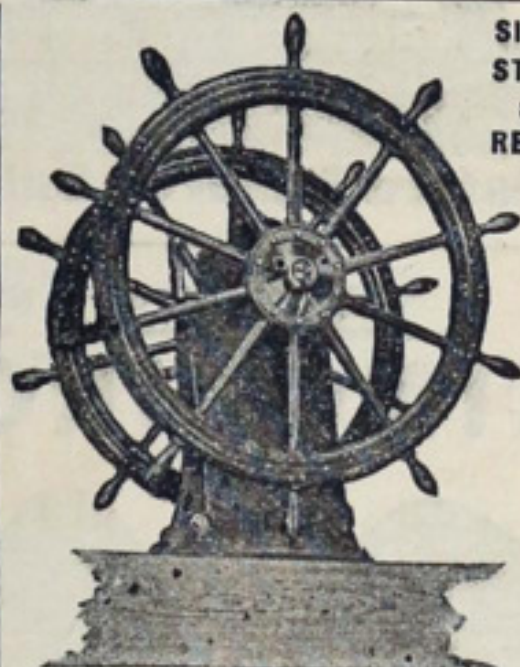
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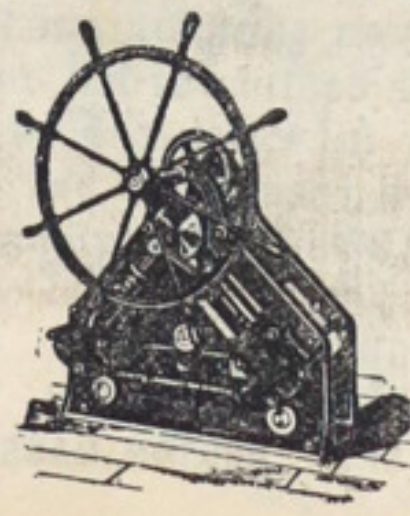
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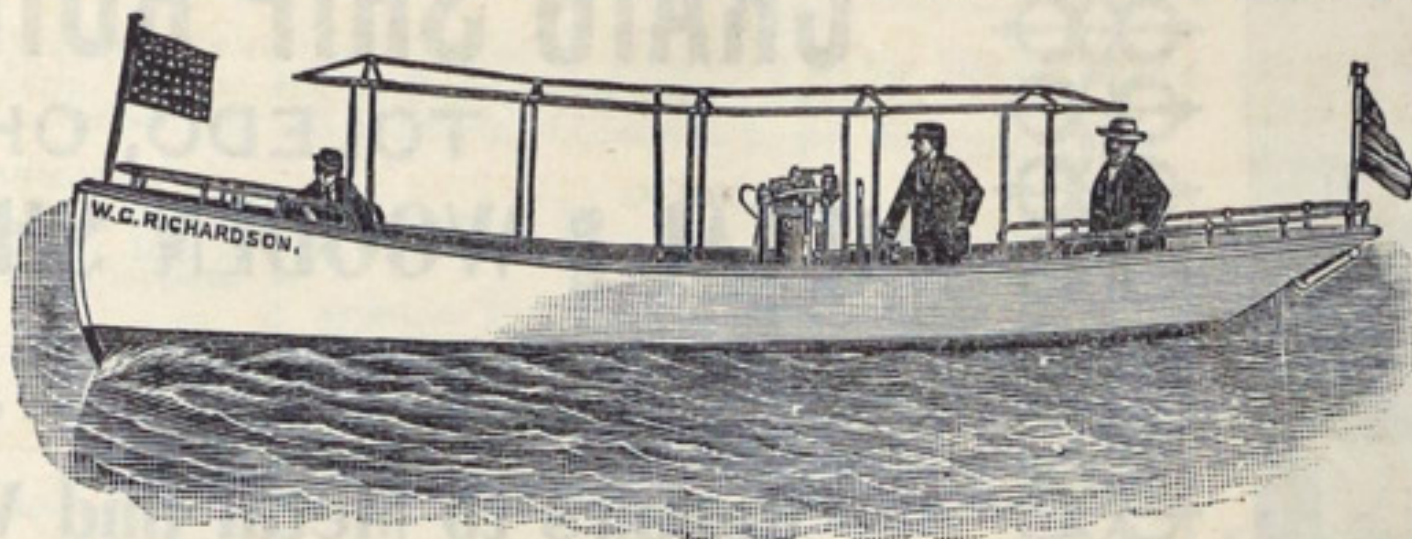


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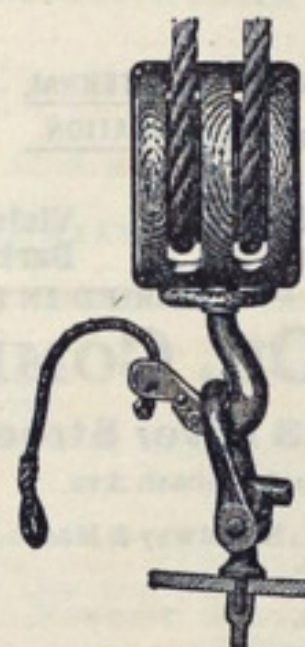
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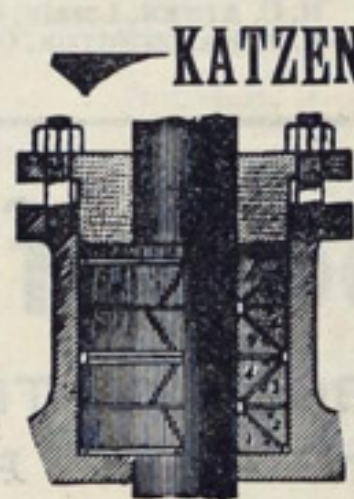


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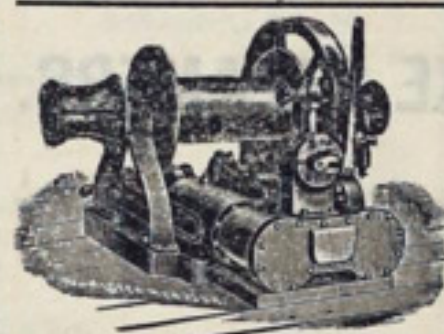
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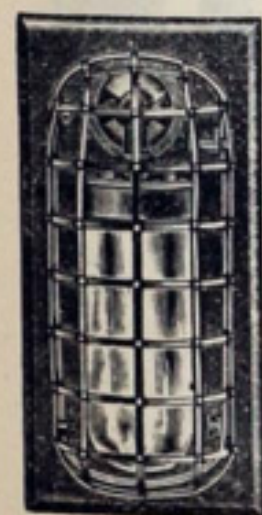
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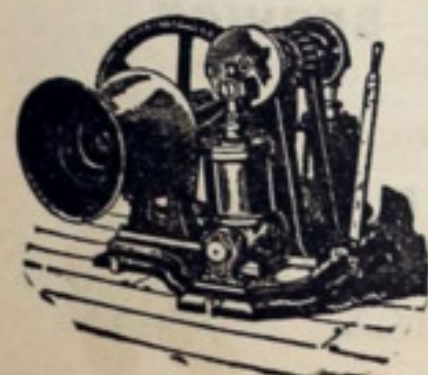
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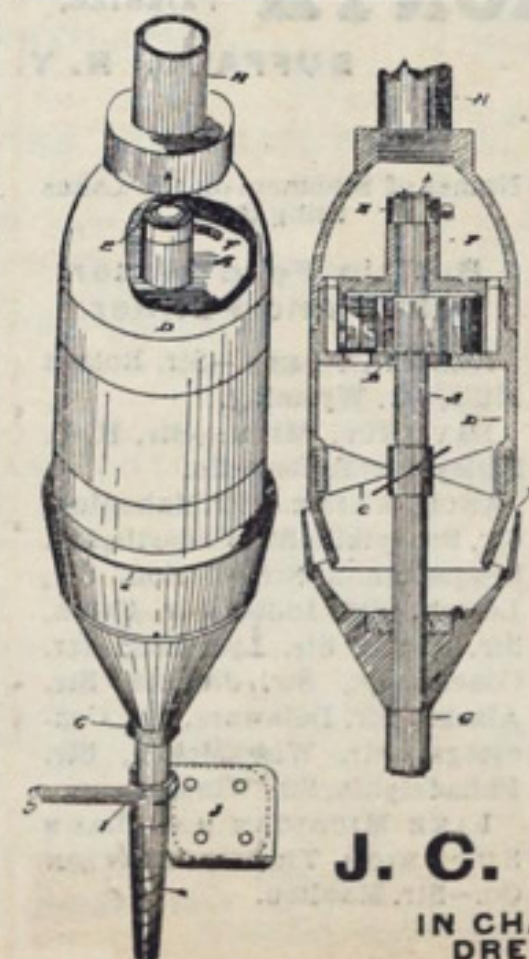
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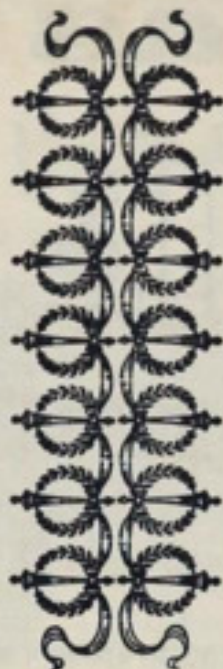
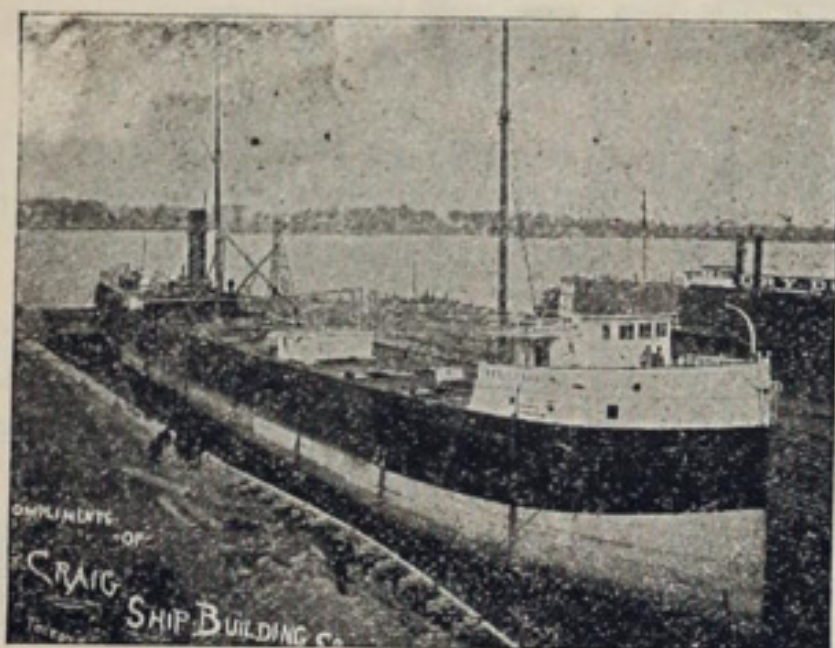
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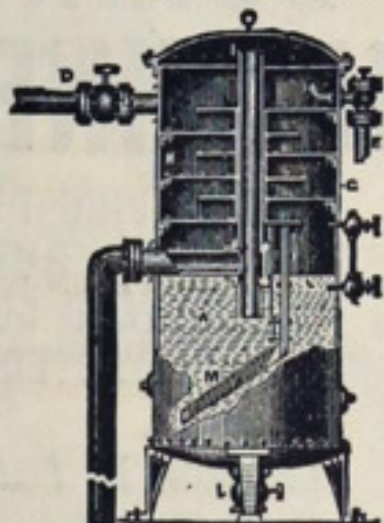
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# BUYERS' DIRECTORY OF THE MARINE TRADE.

For a more complete classification than that represented by advertisers in the Marine Review, see the BLUE BOOK OF AMERICAN SHIPPING, published by the Marine Review, 418-419 Perry-Payne Bldg., Cleveland.  
See accompanying index of advertisers for full addresses of concerns in this directory.

## ARTIFICIAL DRAFT FOR BOILERS.

Detroit Dry Dock Co. .... Detroit.  
B. F. Sturtevant Co. .... Boston.  
Globe Iron Works Co. .... Cleveland.

## ADJUSTERS.

Johnson & Higgins. .... Buffalo.  
Chas. E. & W. F. Peck. .... Chicago.

## ANCHORS.

Baldt Anchor Co. .... Chester, Pa.  
International Anchor Co. .... Cleveland.

## ANTI-FRICTION METALS.

Magnolia Metal Co. .... New York.  
Phosphor Bronze Smelting Co., Ltd. .... Philadelphia.

## ASBESTOS.

H. W. Johns Mfg. Co. .... New York.

## ATTORNEYS AND PROCTORS IN ADMIRALTY.

Harvey L. Brown. .... Buffalo.  
Harvey D. Goulder. .... Cleveland.  
Albert J. Gilchrist. .... Cleveland.  
Orestes C. Pinney. .... Cleveland.  
Hoyt, Dustin & Kelley. .... Cleveland.  
White, Johnson, McCaslin & Cannon. .... Cleveland.  
Mackey & Bell. .... Buffalo.

## BOILER MANUFACTURERS.

Almy Water Tube Boiler Co. .... Providence, R. I.  
Detroit Screw Works. .... Detroit.  
Farrar & Trefts. .... Buffalo.  
W. & A. Fletcher Co. .... Hoboken, N. J.  
Gas Engine & Power Co. .... Morris Heights, N. Y.  
Mackinnon Mfg. Co. .... Bay City, Mich.  
Babcock & Wilcox Co. .... New York.  
Roberts Safety Water Tube Boiler Co. .... New York.  
S. F. Hodge & Co. .... Detroit.  
Frontier Iron Works. .... Detroit.  
Kling Bros. .... Chicago.  
Chicago Ship Building Co. .... Chicago.  
Dry Dock Engine Works. .... Detroit.  
Cleveland Ship Building Co. .... Cleveland.  
Globe Iron Works Co. .... Cleveland.  
Newport News Ship Bldg. & Dry Dock Co. .... Newport News, Va.

## BUCKETS, ORE AND COAL.

McMyler Mfg. Co. .... Cleveland.  
Brown Hoisting & Conveying Mach. Co. .... Cleveland.

## BEAM ENGINES.

W. & A. Fletcher Co. .... Hoboken, N. J.

## BLOCK MANUFACTURERS.

Cleveland Block Co. .... Cleveland.

## BLOWERS FOR FORCED DRAFT.

American Blower Co. .... Detroit.  
B. F. Sturtevant Co. .... Boston.

## BAROMETERS.

L. Black & Co. .... Detroit.  
John Bliss & Co. .... New York.  
Also most of the ship chandlers.

## BOAT BUILDERS.

Gas Engine & Power Co. and Chas. L. Seabury & Co., Consolidated. .... New York.  
Thos. Drein & Son. .... Wilmington, Del.

## BROKERS.

See Vessel Agents.

## BOILER CIRCULATORS.

H. Bloomsburg & Co. .... Newport News, Va.

## BOILER PLATES.

Bourne-Fuller Co. .... Cleveland.

## BOILER TUBES, SEAMLESS, COLD DRAWN.

Shelby Steel Tube Co. .... Cleveland.

## BOILER FURNACES, FIRE FRONTS AND DOORS.

Continental Iron Works. .... New York.

## BOILER AND PIPE COVERING.

H. W. Johns Mfg. Co. .... New York.

## BRASS AND BRONZE CASTINGS.

Chas. Cory & Son. .... New York.  
Standard Brass Works. .... Kalamazoo, Mich.  
Magnolia Metal Co. .... New York.  
Detroit Sheet Metal & Brass Works. .... Detroit.

## BRIDGES, BUILDINGS, STRUCTURAL WORK.

Berlin Iron Bridge Co. .... East Berlin, Conn.

## CABIN AND CABINET FINISHING WOODS.

Martin-Barriss Co. .... Cleveland.

## CHAINS.

P. Hayden S. H. Co. .... Columbus, O.  
James McKay & Co. .... Pittsburgh, Pa.  
J. B. Carr Co. .... Troy, N. Y.

## CHARTS AND SAILING DIRECTIONS.

Marine Review. .... Cleveland.

## CLASSIFICATION OF VESSELS.

Great Lakes Register. .... Chicago.

## COAL DEALERS.

See fueling concerns and coal shippers.

## COAL SHIPPERS.

Cuddy-Mullen Coal Co. .... Cleveland.  
M. A. Hanna & Co. .... Cleveland.  
Pickands, Mather & Co. .... Cleveland.  
W. L. Scott Co. .... Erie, Pa.  
Rochester & Pittsburgh Coal & Iron Co. .... Buffalo.  
Pittsburgh & Chicago Gas Coal Co. .... Cleveland.  
Youghiogheny River Coal Co. .... Erie, Pa.  
Osborne, Saeger & Co. .... Cleveland.  
Castner, Curran & Bullitt (Pocahontas). .... Philadelphia.

## COAL AND ORE HANDLING MACHINERY.

Brown Hoisting & Conveying Mach. Co. .... Cleveland.  
McMyler Mfg. Co. .... Cleveland.  
Lidgerwood Mfg. Co. .... New York.

## COMPASSES.

John Bliss & Co. .... New York.  
L. Black & Co. .... Detroit.

## CAPSTANS.

American Ship Windlass Co. .... Providence, R. I.  
Hyde Windlass Co. .... Bath, Me.

## COPPER AND SHEET IRON WORK.

Detroit Sheet Metal & Brass Works. .... Detroit.

## COMPASS ADJUSTER.

Geo. A. Simpson. .... Sault Ste. Marie, Mich.

## CRANES.

Brown Hoisting & Conveying Mach. Co. .... Cleveland.  
McMyler Mfg. Co. .... Cleveland.  
Lidgerwood Mfg. Co. .... New York.

## CONDENSERS.

See pumps.

## CONTRACTORS FOR PUBLIC WORKS.

Cleveland Dredge Co. .... Cleveland.  
W. A. McGillis & Co. .... Cleveland.

## CORDAGE.

See ship chandlers.

## CORK JACKETS AND RINGS.

Armstrong Cork Co. .... Pittsburgh, Pa.

## DIVING APPARATUS.

A. J. Morse & Son. .... Boston.

## DREDGING AND DOCK CONTRACTORS.

W. A. McGillis & Co. .... Cleveland.  
Cleveland Dredge Co. .... Cleveland.

## DRY DOCKS.

American Steel Barge Co. .... West Superior, Wis.  
Chicago Ship Building Co. .... Chicago.  
Craig Ship Building Co. .... Toledo, O.  
Detroit Dry Dock Co. .... Detroit.  
Milwaukee Dry Dock Co. .... Milwaukee.  
Newport News Ship Bldg. & Dry Dock Co. .... Newport News, Va.  
Ship Owners' Dry Dock Co. .... Cleveland.  
Cleveland Ship Building Co. .... Lorain.  
Union Dry Dock Co. .... Buffalo.

## ENGINE BUILDERS, MARINE.

Farrar & Trefts. .... Buffalo.  
W. & A. Fletcher Co. .... Hoboken, N. J.  
Frontier Iron Works. .... Detroit.  
Gas Engine & Power Co. and Chas. L. Seabury & Co., Consolidated. .... New York.  
S. F. Hodge & Co. .... Detroit.  
Mackinnon Mfg. Co. .... Bay City, Mich.  
B. F. Sturtevant Co. .... Boston.  
Globe Iron Works Co. .... Cleveland.  
Cleveland Ship Building Co. .... Cleveland.  
Chase Machine Co. .... Cleveland.  
H. G. Trout. .... Buffalo.  
Dry Dock Engine Works. .... Detroit.  
American Steel Barge Co. .... West Superior, Wis.  
Chicago Ship Building Co. .... Chicago.  
Sheriffs Mfg. Co. .... Milwaukee.

## ENGINE ROOM TELEGRAPH.

Chas. Cory & Son. .... New York.  
Chadburn & Son. .... 11 Waterloo Rd., Liverpool.

## ENGINEERS' SUPPLIES.

Detroit Sheet Metal & Brass Works. .... Detroit.  
Chase Machine Co. .... Cleveland.

## ELECTRIC LIGHT AND POWER PLANTS.

General Electric Co. .... Schenectady, N. Y.  
B. F. Sturtevant Co. .... Boston.

## ELECTRIC HOISTS.

General Electric Co. .... Schenectady, N. Y.  
Lidgerwood Mfg. Co. .... New York.

## ENGINEERS, CONSULTING (MECHANICAL AND MARINE).

Miers Coryell. .... New York.  
John Haug. .... Philadelphia.  
Ambrose V. Powell. .... Chicago.  
W. J. Wood. .... Chicago.  
Walter Miller. .... Cleveland.  
Joseph R. Oldham. .... Cleveland.

## EOPHONES.

Eophone Co. .... New York.

## FANS FOR VENTILATION.

American Blower Co. .... Detroit.  
B. F. Sturtevant Co. .... Boston.

## FEED WATER PURIFIER AND HEATERS.

Robert Learmonth. .... Buffalo.

## FORGINGS, IRON AND STEEL.

Cleveland City Forge & Iron Co. .... Cleveland.  
Bethlehem Iron Co. .... South Bethlehem.

## FORWARDERS OF FREIGHT.

Thomas Wilson. .... Cleveland.  
C. H. Tucker. .... Cleveland.  
Bessemer Steamship Co. .... Cleveland.

## FUELING COMPANIES AND COAL DEALERS.

Cuddy-Mullen Coal Co. .... Cleveland.  
James Graham & Co. .... Detroit.  
M. A. Hanna & Co. .... Cleveland.  
Mark H. Hanlon. .... Cleveland.  
Pickands, Mather & Co. .... Cleveland.  
O. S. Richardson Fueling Co. .... Chicago.  
Stanley B. Smith & Co. .... Detroit.  
Pittsburgh & Chicago Gas Coal Co. .... Cleveland.  
Rochester & Pittsburgh Coal & Iron Co. .... Buffalo.  
Port Royal Dock Co. .... Sault Ste. Marie, Mich.  
W. L. Scott Co. .... Erie, Pa.  
Youghiogheny River Coal Co. .... Ashtabula.  
Youghiogheny & Lehigh Coal Co. .... Chicago.  
Osborne, Saeger & Co. .... Cleveland.  
Castner, Curran & Bullitt (Pocahontas). .... Philadelphia.

## FLAGS AND BUNTING.

See ship chandlers.

## FIXTURES FOR LAMPS, OIL AND ELECTRIC.

Wm. Porter's Sons. .... New York.  
Page Bros. & Co. .... Boston.

## FURNACES FOR BOILERS.

Continental Iron Works. .... New York.

## GAS BUOYS.

Safety Car Heating & Lighting Co. .... New York.

## GAS ENGINES.

Frontier Iron Works. .... Detroit.  
McMyler Mfg. Co. .... Cleveland.

## GLASSES, MARINE.

See ship chandlers and dealers in nautical instruments.

## GAUGES, STEAM.

Crosby Steam Gauge & Valve Co. .... Boston.  
See also valves and engineers' supplies.

## GRAPHITE.

Joseph Dixon Crucible Co. .... Jersey City, N. J.

## GREASE CUPS.

See engineers' supplies.

## HEATERS, STEAM.

American Blower Co. .... Detroit.

## HARDWARE, MARINE.

L. W. Ferdinand & Co. .... Boston.  
Detroit Sheet Metal & Brass Works. .... Detroit.

## HOISTING ENGINES.

Chase Machine Co. .... Cleveland.  
S. F. Hodge & Co. .... Detroit.  
Jackson & Church. .... Saginaw.  
Lidgerwood Mfg. Co. .... New York.  
Marine Iron Co. .... Bay City.  
Globe Iron Works Co. .... Cleveland.  
Williamson Bros. .... Philadelphia.  
Hyde Windlass Co. .... Bath, Me.

## HOSE, DECK AND FIRE PURPOSES.

The Manhattan Rubber Mfg. Co. .... New York, Cleveland and Chicago.

## HAMMERS, POWER DROP.

Chase Machine Co. .... Cleveland.

## INDICATORS, CALL BELLS.

Chas. Cory & Son. .... New York.  
Chadburn & Son. .... 11 Waterloo Rd., Liverpool.

## INJECTORS.

Jenkins Bros. .... New York.

## INSURANCE, MARINE.

Chas. E. & W. F. Peck. .... New York and Chicago.  
Johnson & Higgins, represented by  
F. P. Gordon. .... Buffalo.  
Insurance Co. of North America, represented by  
Geo. L. McCurdy. .... Chicago.  
Brown & Co. .... Buffalo.  
C. W. Elphicke & Co. .... Chicago.  
J. G. Keith & Co. .... Chicago.  
La Salle & Co. .... Duluth.  
Parker & Millen. .... Detroit.  
Mitchell & Co. .... Cleveland.  
W. C. Richardson. .... Cleveland.  
Hawgood & Moore. .... Cleveland.  
John Gordon & Co. .... Buffalo.  
Drake & Maytham. .... Buffalo.  
Hutchinson & Co. .... Cleveland.  
C. R. Jones & Co. .... Cleveland.  
J. H. Bartow. .... Cleveland.

## IRON ORE AND PIG IRON.

M. A. Hanna & Co. .... Cleveland.  
Pickands, Mather & Co. .... Cleveland.

## LIFE PRESERVERS, LIFE BOATS, BUOYS, RAFTS, ETC.

Armstrong Cork Co. .... Boston.  
Detroit Sheet Metal & Brass Works. .... Detroit.  
Thos. Drein & Son. .... Wilmington, Del.  
D. Kahnweiler. .... New York.

## LIGHTS, PORTABLE, SELF-CONTAINED.

The Wells Light Mfg. Co. .... New York.

## LIGHTS, SIDE AND SIGNAL.

Page Bros. & Co. .... Boston.  
Wm. Porter's Sons. .... New York.

## MANILA ROPE.

Upson-Walton Co. .... Cleveland.

## MARINE GLASSES, BAROMETERS, ETC.

L. Black & Co. .... Detroit.  
John Bliss & Co. .... New York.  
Also most of the ship chandlers.

## METALLIC PACKING.

U. S. Metallic Packing Co. .... Philadelphia.  
L. Katzenstein & Co. .... New York.

## MARINE TELEGRAPH.

Chas. Cory & Son. .... New York.  
Chadburn & Son. .... 11 Waterloo Rd., Liverpool.

## METALS FOR BEARINGS.

Magnolia Metal Co. .... New York.  
Phosphor Bronze Smelting Co., Ltd. .... Philadelphia.

## MAGNOLIA METAL.

Magnolia Metal Co. .... New York.

## METALLIC LIFE BOATS.

Thos. Drein & Son. .... Wilmington, Del.  
D. Kahnweiler. .... New York.

## MARINE GLUE.

L. W. Ferdinand & Co. .... Boston.

## NAUTICAL INSTRUMENTS.

John Bliss & Co. .... New York.  
L. Black & Co. .... Detroit.



# BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

## NAPHTHA LAUNCHES.

Gas Engine & Power Co.....New York.

## NAVAL ARCHITECTS.

Frank E. Kirby .....Detroit.  
W. J. Wood .....Chicago.  
John Haug .....Philadelphia.  
Joseph R. Oldham .....Cleveland.  
Robert Curr .....Cleveland.

## OAK TIMBER AND PLANK.

Martin-Barriss Co. ....Cleveland.

## OILS AND LUBRICANTS.

Jos. Dixon Crucible Co.....Jersey City, N. J.  
Lake Carriers' Oil Co.....Cleveland.  
Standard Oil Co. ....Cleveland.

## PATENT ATTORNEY.

Wm. M. Monroe.....Cleveland.

## PASSENGER AND FREIGHT STEAMSHIP LINES.

Cleveland & Buffalo Transit Co.....Cleveland.  
Detroit & Cleveland Navigation Co.....Detroit.  
Goodrich Transportation Co. ....Chicago.  
Lackawanna-Green Bay Line, C. H. Tucker....Cleveland.  
Lake Michigan & Lake Superior Trans. Co.Chicago.  
Northern Steamship Co. ....Buffalo.  
Ogdensburg Transit Co.....Ogdensburg, N. Y.  
Northern Transit Co.....Cleveland.  
Graham & Morton Trans. Co.....Chicago.

## PNEUMATIC TOOLS.

Chicago Pneumatic Tool Co.....Chicago.

## POCAHONTAS COAL.

Castner, Curran & Bullitt.....Philadelphia.

## PROPELLER WHEELS.

Dry Dock Engine Works .....Detroit.  
Cleveland Ship Building Co.....Cleveland.  
Globe Iron Works Co.....Cleveland.  
Farrar & Trefts .....Buffalo.  
S. F. Hodge & Co.....Detroit.  
Phosphor Bronze Smelting Co., Ltd.....Philadelphia.  
Mackinnon Mfg. Co.....Bay City.  
Sheriffs Mfg. Co.....Milwaukee.  
H. G. Trout .....Buffalo.  
Frontier Iron Works.....Detroit.  
Hyde Windlass Co.....Bath, Me.

## PRESSURE REGULATORS AND REDUCING VALVES.

G. M. Davis & Co.....Chicago.  
Foster Engineering Co.....Newark, N. J.

## PACKING.

A. W. Chesterton & Co.....Boston.  
H. W. Johns Mfg. Co.....New York.  
Jenkins Bros. ....New York.  
L. Katzenstein & Co.....New York.  
Manhattan Rubber Mfg. Co.....New York.  
U. S. Metallic Packing Co.....Philadelphia.  
Peerless Rubber Mfg. Co.....New York.

## PAINTS.

Upson-Walton Co. ....Cleveland.  
Howard H. Baker & Co.....Buffalo.

## PUMPS, STEAM.

Geo. F. Blake Mfg. Co.....New York.  
Henry R. Worthington.....New York.

## PUMPS, ELECTRIC.

General Electric Co.....Schenectady, N. Y.

## RELEASING HOOKS FOR DETACHING BOATS.

Standard Aut. Releasing Hook Co.....New York.

## RIVETS, STEEL.

Bourne-Fuller Co. ....Cleveland.

## RUBBER GOODS FOR STEAMERS.

Manhattan Rubber Mfg. Co.....New York and Cleveland.  
Peerless Rubber Mfg. Co.....New York.

## RUBBER INSULATED WIRES.

John A. Roebling's Sons Co.....New York and Cleveland.

## SAIL MAKERS.

Howard H. Baker & Co.....Buffalo.  
Upson-Walton Co. ....Cleveland.

## SHIP PLATES, STEEL.

Bourne-Fuller Co. ....Cleveland.

## SALVAGE COMPANIES.

See wrecking companies.

## SEARCH LIGHTS.

General Electric Co.....Schenectady, N. Y.

## SURVEYORS, MARINE.

Robert Curr .....Cleveland.  
Capt. D. McLeod .....Cleveland.  
Joseph R. Oldham .....Cleveland.

## SHIP CHANDLERS.

Howard H. Baker & Co.....Buffalo.  
Upson-Walton Co. ....Cleveland.

## SOUND DETECTORS.

Eophone Co. ....New York.

## STEAM, VACUUM AND HYDRAULIC SPECIALTIES.

William Craig .....New York.

## SHIP BUILDERS.

American Steel Barge Co.....West Superior, Wis.  
Craig Ship Building Co.....Toledo, O.  
Chicago Ship Building Co.....Chicago.  
Detroit Dry Dock Co.....Detroit.  
Newport News Ship Building & Dry Dock Co.....Newport News, Va.  
Cleveland Ship Building Co.....Cleveland.  
Globe Iron Works Co.....Cleveland.  
Union Dry Dock Co.....Buffalo.

## STOCKLESS ANCHORS.

Baldt Anchor Co.....Chester, Pa.  
International Anchor Co.....Cleveland.

## STEERING ENGINES.

Pawling & Harnischfeger .....Milwaukee.  
Sheriffs Mfg. Co.....Milwaukee.  
Chase Machine Co.....Cleveland.  
Globe Iron Works Co.....Cleveland.  
Williamson Bros. ....Philadelphia.  
Hyde Windlass Co.....Bath, Me.

## STEAM HAMMERS, RIVETING MACHINES.

Bement, Miles & Co.....Philadelphia.

## TRAPS, STEAM.

Wm. S. Haines Co.....Philadelphia.

## TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Bement, Miles & Co.....Philadelphia.  
Chicago Pneumatic Tool Co.....Chicago.  
Hilles & Jones Co.....Wilmington, Del.

## TOWING MACHINES.

American Ship Windlass Co.....Providence, R. I.

## TOWING COMPANIES.

Barry Bros. Independent Tug Line.....Chicago.  
Escanaba Towing & Wrecking Co.....Escanaba, Mich.  
The Vessel Owners' Towing Co.....Cleveland.

## TUBING, COPPER AND BRASS.

Randolph & Clowes .....Waterbury, Conn.

## VALVES.

Crosby Steam Gauge & Valve Co.....Boston.  
Jenkins Bros. ....New York.  
G. M. Davis Co.....Chicago.  
Foster Engineering Co.....Newark, N. J.

## VESSEL AND FREIGHT AGENTS.

Brown & Co. ....Buffalo.  
J. H. Bartow .....Cleveland.  
Drake & Maytham .....Buffalo.  
C. W. Elphicke & Co.....Chicago.  
John Gordon & Co.....Buffalo.  
Hawgood & Moore .....Cleveland.  
Hutchinson & Co.....Cleveland.  
C. R. Jones & Co.....Cleveland.  
Mitchell & Co.....Cleveland.  
W. C. Richardson .....Cleveland.

## WIRE ROPE.

John A. Roebling's Sons Co.....New York and Cleveland.  
Upson-Walton Co. ....Cleveland.  
H. H. Baker & Co.....Buffalo.  
Phosphor Bronze Smelting Co., Ltd.....Philadelphia.

## WHISTLES, STEAM.

Crosby Steam Gauge & Valve Co.....Boston.

## WINDLASSES.

American Ship Windlass Co.....Providence, R. I.  
Hyde Windlass Co.....Bath, Me.  
Globe Iron Works Co.....Cleveland.

## WINCHES.

American Ship Windlass Co.....Providence, R. I.

## WRECKING AND SALVAGE COMPANIES.

Escanaba Towing & Wrecking Co.....Escanaba, Mich.  
Donnelly Salvage & Wrecking Co.....Kingston, Ont.  
Swain Wrecking Co. ....Detroit.  
Vessel Owners' Towing Co.....Cleveland.

## YACHT BOILERS.

Detroit Screw Works.....Detroit.

## YACHT PLUMBERS.

Alfred B. Sands & Son.....New York.

## YACHT AND BOAT BUILDERS.

Thos. Drein & Son.....Wilmington, Del.  
Gas Engine & Power Co.....New York.

## YACHT, BOAT AND CANOE HARDWARE.

L. W. Ferdinand & Co.....Boston.

## YAWLS.

Thos. Drein & Son.....Wilmington, Del.

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Baker, Howard H. & Co.....	21	Eophone Co.....	5	*Learmonth, Robert .....	24	Co. ....	19
Bartow, J. H.....	4	Escanaba Towing & Wrecking Co...	19	Lidgerwood Mfg. Co.....	5	*Roebling's, John A., Sons Co.....	28
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CITY OF BUFFALO } .....	1.78
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KALIYUGA.....	1.86
IRON AGE.....	1.72
A. McVITTIE .....	1.82

These Steamers have Triple Engines.

Pounds of Coal per  
I. H. P. per Hour.

PIONEER.....	1.68
RAPPAHANNOCK.....	1.75
MADAGASCAR.....	1.82
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ARAGON.....	1.63
SENATOR .....	1.66
THOS. WILSON .....	1.64

This Steamer built in 1898, has Quadruple Engines.

Pounds of Coal per I. H. P. per Hour.

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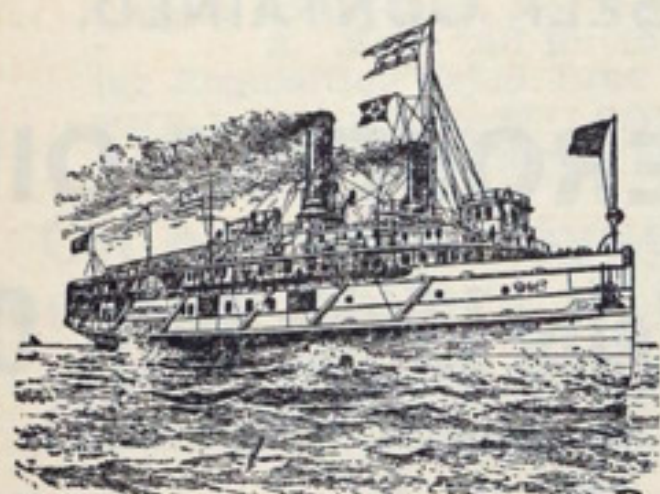
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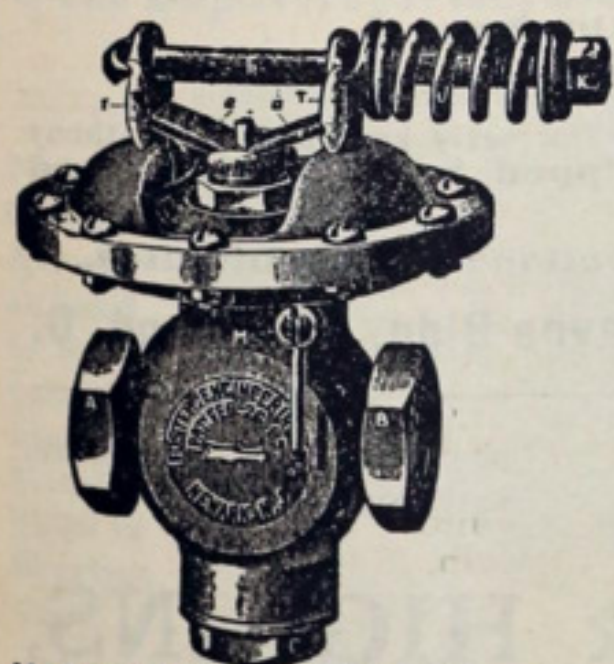
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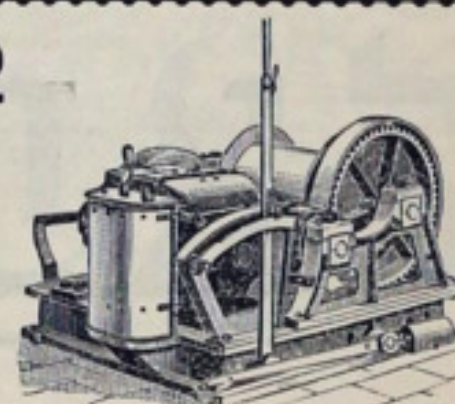
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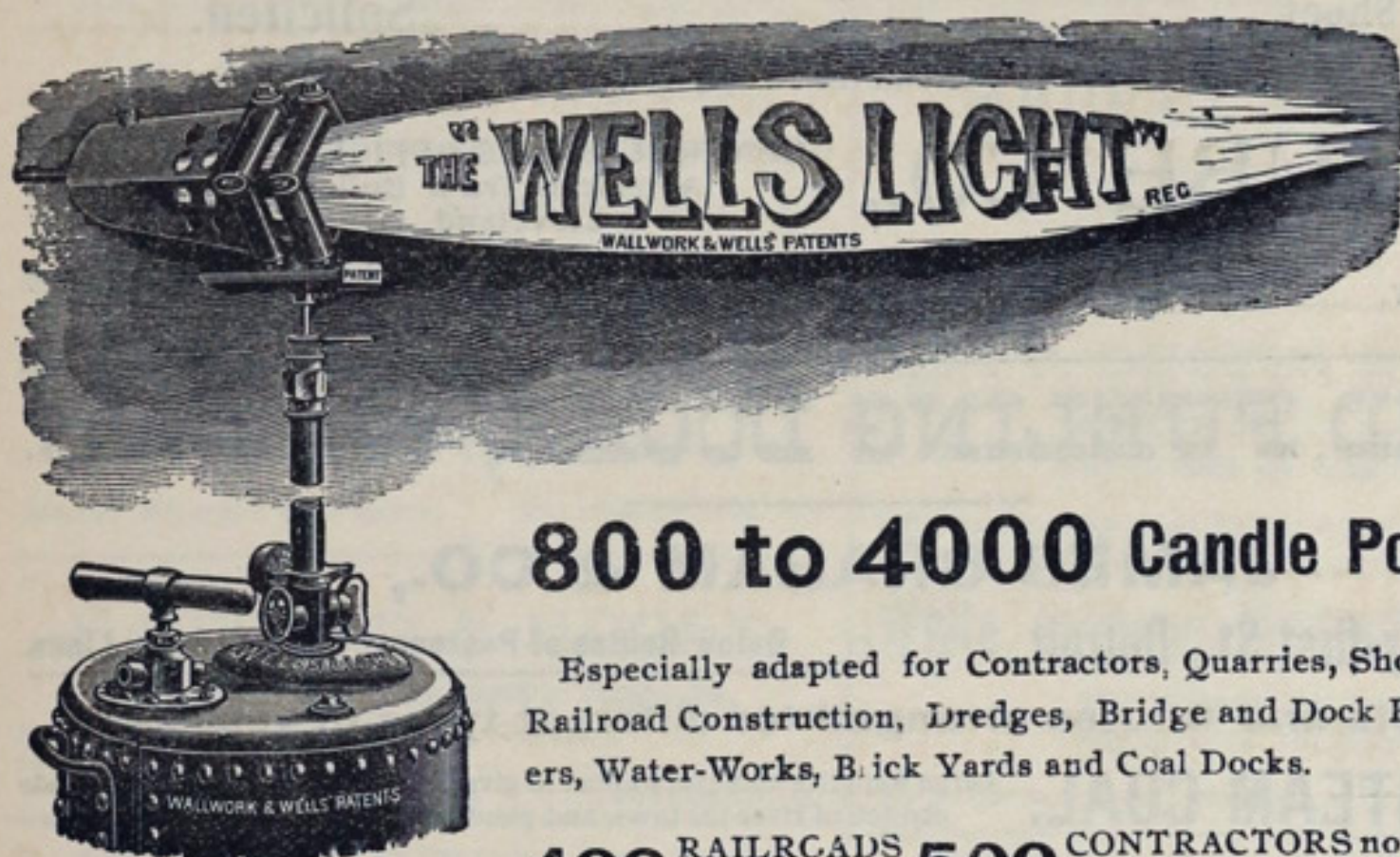
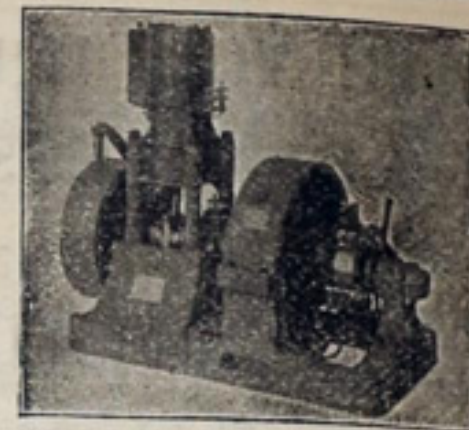
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In reply refer to No. 29181.

Gentlemen:

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1. Please forward to the Commanding Officer, U. S. S. 'MARIETTA', Key West, Fla., 8 fire bricks, 4 rights and 4 lefts, No. R, 3440, Babcock & Wilcox boilers, to replace broken bricks between furnace doors.
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THE BABCOCK & WILCOX CO.,  
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Respectfully,

(Sig.) EDWIN STEWART, Paymaster General,  
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On her long voyage the MARIETTA was not detained an instant on account of boilers.

THE BABCOCK & WILCOX CO., WATER TUBE BOILERS, 29 Cortlandt St., New York.



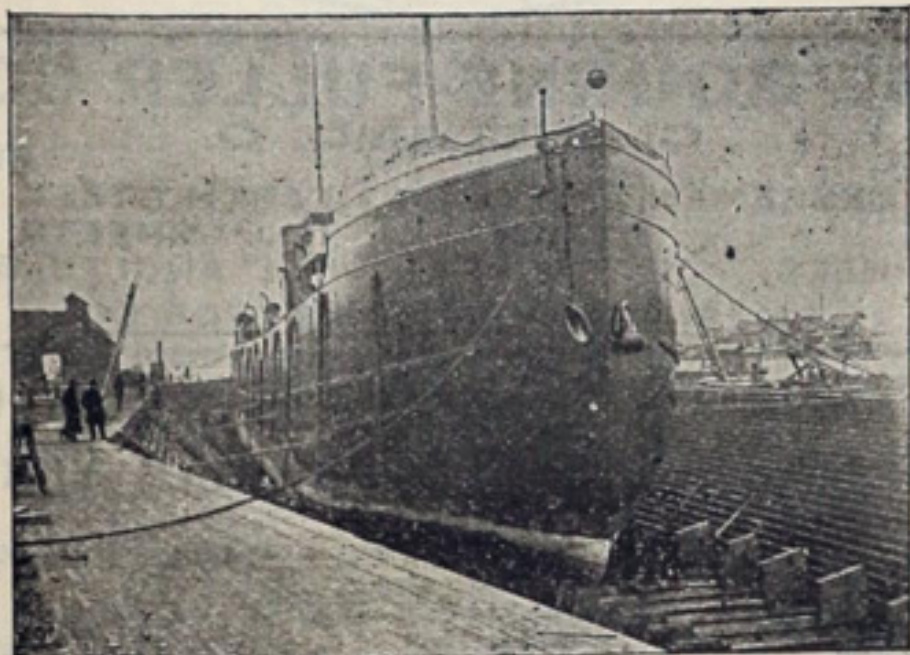
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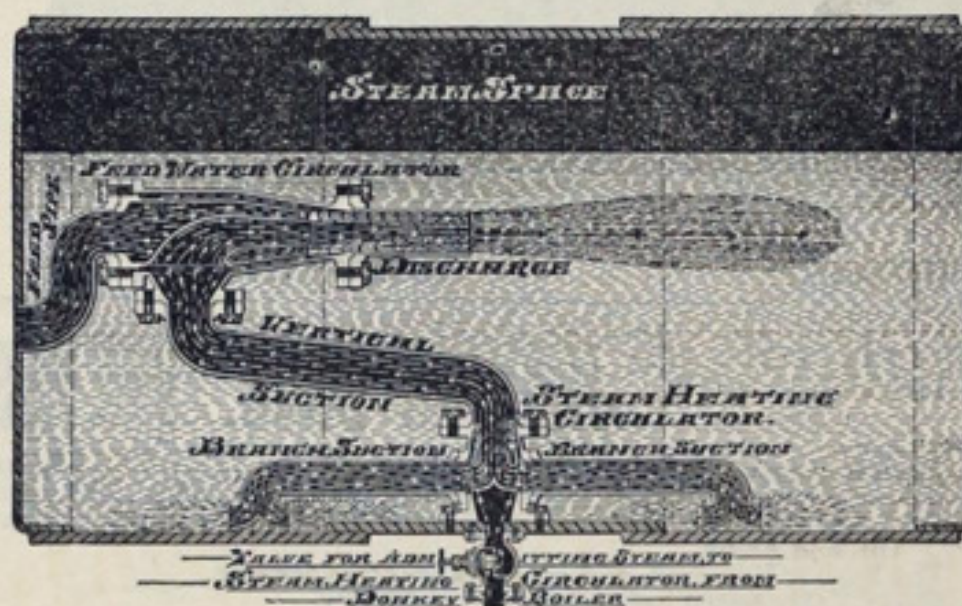
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Will pay for it-  
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with saving in  
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Has no extra  
Joints to leak.

Creates a con-  
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as long as  
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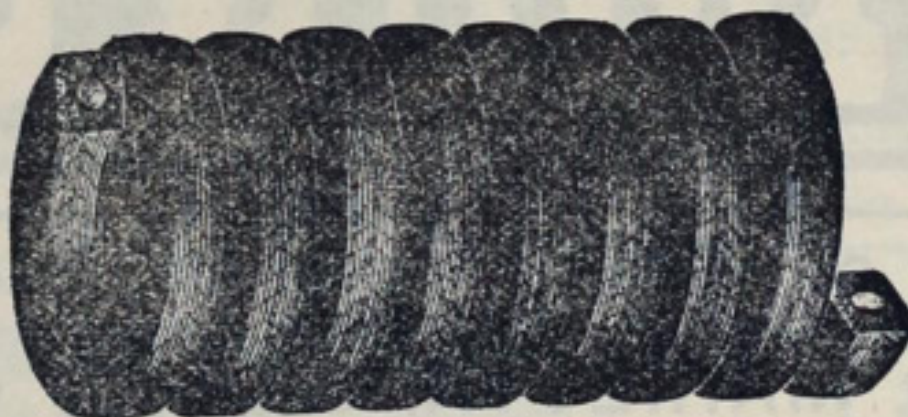
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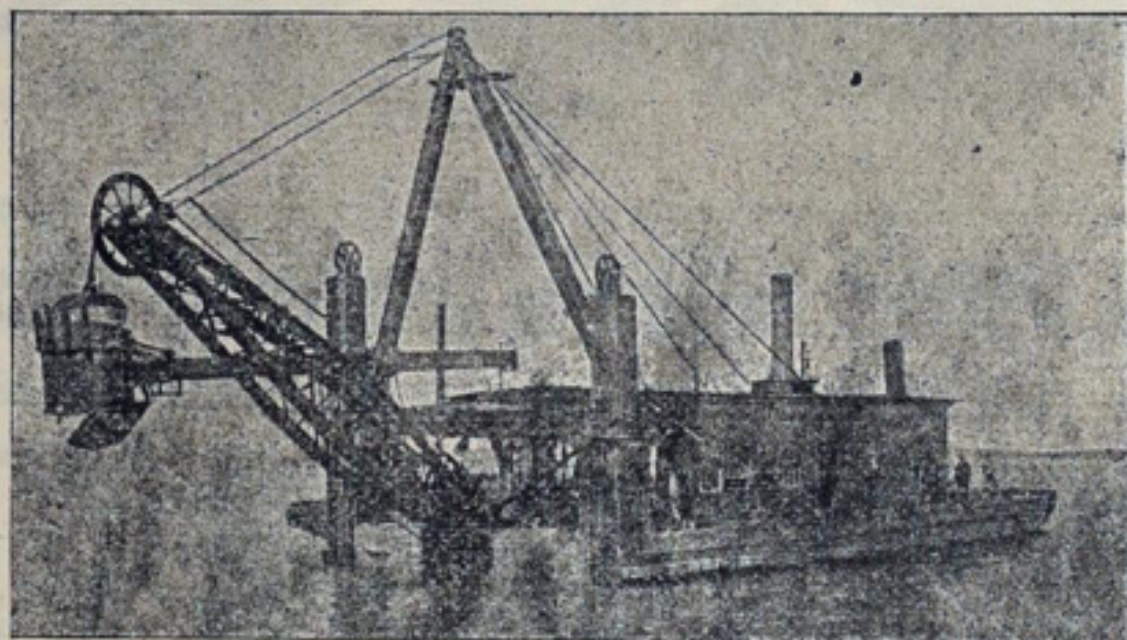
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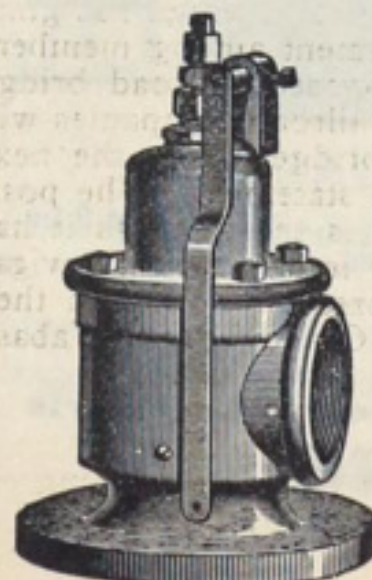
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